

U. S. DEPARTMENT OF COMMERCE  
WEATHER BUREAU

KEY TO METEOROLOGICAL RECORDS DOCUMENTATION NO. 5.33

CATALOGUE OF METEOROLOGICAL  
SATELLITE DATA—TIROS III  
TELEVISION CLOUD  
PHOTOGRAPHY

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U. S. DEPARTMENT OF COMMERCE  
LUTHER H. HODGES, Secretary  
WEATHER BUREAU  
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WASHINGTON, D. C. : 1962

### PURPOSE

The Key to Meteorological Records Documentation Series has been established to provide guidance information to research personnel making use of climatological data.

Frequently users of such data have found it necessary to spend a great deal of time establishing whether the criteria for observing or computing various elements have changed over the period of record or in what form the data are available.

It is therefore hoped that the presentation of this series may not only conserve valuable time but may have a direct influence in improving the accuracy of research results.

### PREFACE

This bulletin contains a complete listing of cloud photographs obtained by the TIROS III meteorological satellite, and a set of maps showing their geographical coverage. It also describes how copies of these photographs may be obtained from the National Weather Records Center.

Robert L. Pyle and Leslie A. Watson  
Meteorological Satellite Activities



CATALOGUE OF METEOROLOGICAL SATELLITE DATA--  
TIROS III TELEVISION CLOUD PHOTOGRAPHY

TIROS III was launched by the National Aeronautics and Space Administration on July 12, 1961. It traveled in a nearly circular orbit averaging about 410 nautical miles above the earth's surface with a difference of about 45 nautical miles between apogee and perigee. The orbit was inclined at an angle of  $47.9^\circ$  to the earth's equatorial plane and thus, as with TIROS I, picture coverage could be obtained only in the zone bounded roughly by  $55^\circ\text{N.}$  and  $\text{S.}$  latitude. The orbital period of 100.4 minutes corresponded to fourteen and a fraction passes around the earth each day.

The satellite was spinning at a rate that varied between 8 and 12 r.p.m. Being spin-stabilized, the spin axis orientation in space changed only gradually during its operational lifetime. Its two cameras were mounted with their optical axes parallel to the spin axis, so that the earth was within their fields of view during somewhat less than half of each orbital pass. Usable picture coverage was thus restricted to the portion of each orbital pass during which the underlying earth was both sunlit and within view of the cameras. Each of the two cameras on TIROS III had a wide-angle lens which covered an area about 750 miles square when the optical axis was normal to the earth's surface. At other times a larger area was viewed in oblique perspective.

Camera action aboard TIROS III was controlled from two Command-and-Data-Acquisition (CDA) stations, one located at Wallops Station near Chincoteague, Va., and the other at Pacific Missile Range, Point Mugu, Calif. The satellite came within radio range of one or both of these stations for a few minutes each on eight or sometimes nine of its 14 daily passes. During these radio contacts the station could:

- 1) receive a series of television pictures directly as they were taken, if it was daytime and the optical axes were appropriately oriented;
- 2) command the system to take pictures remote from the CDA station after a specified time delay and store them on tape aboard the satellite;
- 3) play back one previously commanded tape sequence from each camera.

Occasionally the direct pictures obtained on one pass may be grouped into two sequences if the series was interrupted to permit playback of radiation data or a tape sequence. The time interval between frames was either 10 or 30 seconds for most direct sequences. Tape pictures were always taken at 30-second time intervals in sequences of up to 32 frames each.

The pictures are virtually square with some small distortion resulting from the particular setting of the electronic readout equipment. "Fiducial marks" etched on the face of the vidicon tube appear in the picture image as a central cross and four L-shaped corners, although they may show poorly or not at all against a dark background.

Since the satellite was spinning, the earth's image rotates from frame to frame by an amount that depends on how much the satellite's spin rate departed from being an integral number of rotations during the picture-taking interval. The rotation rate may be considered constant during any one sequence. The center of rotation, which is the point where the optical and spin axes intersect the image plane, is not quite at the central fiducial cross mark, but is displaced slightly as indicated in reference 27 figures 2 and 3.

Cloud picture transmissions received at CDA stations were displayed on a television screen and simultaneously recorded on magnetic tape. A 35 mm. camera photographed the television screen, including also a panel board mounted underneath. The panel board information provides a legend for each picture including camera number, mode (tape or direct), frame number, orbit pass number, and a clock. In the example of figure 1, the legend indicates the picture was read out on orbital pass number 740, and that it is a tape picture taken by camera 2. The letter H at the lower left indicates the picture was acquired at the Point Mugu station. Pictures acquired at Wallops Station are identified by the letter M at the lower right. The clock shown on the panel board usually gives the time that the archival film was produced.

IT IS IMPORTANT TO NOTE THAT THE TIME SHOWN ON THE CLOCK  
HAS NO RELATION WHATSOEVER TO PICTURE-TAKING TIME.

The panel board legend also contains a series of numerals whose sum indicates frame number. In figure 1, the frame number is 24, representing the sum of 16 and 8. (A similar series of numbers at the bottom of the legend was designed to give information on sun angle, but the system did not work properly and the values cannot be easily interpreted.) Within each sequence, the indicated frame numbers increase in the order that the pictures were received at the CDA station. For direct mode this is the time order in which the pictures were taken. But tape sequences were played back to the station in reverse time order. Pictures of both modes are arranged on the film in order of increasing frame number; therefore it is important to note that this arrangement is correct time order for direct sequences, but is reverse time order for tapes. Malfunctioning occasionally caused the frame counting system to behave erratically resulting in repetition and discontinuity in the frame number series.

The orderly time sequence of pictures is sometimes interrupted by spurious noise frames or complicated by skipped frames. In such cases the erratic frame numbers are not a dependable indicator of real picture counts. However, the regular rotation of image orientation is often a helpful clue in determining the actual time interval between particular frames.

The following pages of maps and tabulated listings give descriptive information about the pictures obtained by TIROS III. In the listings each picture sequence is described by one line, and for each station the sequences are listed in the order in which they appear on the film reel. The column headings and entries have the following meanings:

REEL: Number of the film reel which contains the sequences.

FILM LEGEND: This section gives the information actually appearing on the film in the panel board legend accompanying each picture. This information is used to identify the sequence on the film reel.

PASS: Orbital pass number on which the pictures were read out, as indicated in the upper right corner of the legend.

M: Mode of transmission indicated in the legend.

D = Direct

T = Tape

C: Camera number indicated in the legend.

1 = Camera number one

2 = Camera number two

S: CDA station which received the sequence.

W = Wallops Station, Va.

P = Point Mugu (Pacific Missile Range), Calif.

(When the panel board display contains an error, the legend as it appears on the film is listed under FILM LEGEND with an asterisk to indicate erroneous information. Correct





Figure 1 - Example of TIROS III Cloud Photography

information for mode and camera can always be found in the PICTURE SEQUENCE DATA section. For direct sequences the correct readout orbit pass number is the same as the picture-taking pass number listed under PICTURE SEQUENCE DATA. For tape sequences the correct readout pass number usually can be deduced by comparison with preceding and following sequences. On the film reels, legend inaccuracies are indicated in the sequence title frame by the word ERROR followed by O, C, or M for orbital pass, camera, or mode as appropriate. Unfortunately, errors in frame number and sun angle are too numerous to designate individually in this manner.)

PICTURE SEQUENCE DATA: This section documents the picture content. Sequences having no usable frames are on the film reel and are therefore included in the listings but are not fully documented in this section.

STARTING TIME:

PASS: Orbital pass number on which the first picture of the sequence was taken. For direct sequences this pass number and the readout pass number given under FILM LEGEND are the same. For tape sequences, however, picture taking usually began on an earlier pass.

M: Actual mode of transmission, coded as in FILM LEGEND.

C: Actual camera used, coded as in FILM LEGEND.

DATE: Month and day when the first picture was taken.

TIME: Hour, minute, and second (GMT) when the first picture was taken. On the film reel, the first picture is found at the beginning of direct sequences, but it is at the end of tape sequences because the latter are arranged on the film in reverse time order.

FRAME:

TI: Time interval, in seconds, between frames. V indicates time interval varies within the sequence.

US: Number of usable frames in the sequence.

+: Number of frames in which the central fiducial cross mark appears on the earth, indicating that the earth's image occupies a substantial portion of the picture.

GEOGRAPHICAL AREA COVERED: Column headings refer to numbered areas outlined on the first map. Column entries indicate the areas included in the picture sequence.

L: Presence of a landmark is indicated by the following code:  
0 = No ground image anywhere in the sequence.  
1 = Ground image possible but not seen.  
2 = Ground image noticed but not identified.  
3 = Identified ground image.

VBS: Presence of a Vortex, Cloud Bands, or Cloud Streets in the sequence is indicated by the following code:  
0 = None anywhere in the sequence.  
1 = Ill defined.  
2 = Easily recognized.  
3 = Pronounced.

Following the listings is a series of maps which provides a rough indication of the area covered by each sequence having usable frames. The swaths shown on the maps are based on the nephanalyses prepared at the CDA stations immediately following receipt of the data. For various reasons some of the sequences having usable frames were not analyzed at the CDA stations. In such cases, coverage swaths were determined later by computation. Most of the swaths are considered to be geographically accurate within  $\pm 5^\circ$  of latitude. The swaths are grouped by date and are identified by the picture taking pass number and mode. CDA station initial or camera number is added when necessary to identify definitely the sequence to which the swath applies.

NOTE THAT SEQUENCE SWATHS ON THE MAPS ARE LABELED WITH THE PICTURE-TAKING PASS NUMBER LISTED UNDER "PICTURE SEQUENCE DATA," BUT ON THE FILM THE CORRESPONDING PICTURES ARE IDENTIFIED BY THE READOUT PASS NUMBER LISTED UNDER "FILM LEGEND."

Two direct sequences from the same camera acquired at the same station on the same orbital pass are combined in one swath, since the short time interval between the two sequences usually does not cause a significant gap in the coverage.

The coverage swaths are included in the catalogue only through October since the picture quality had deteriorated considerably by that time. However the listings extend into February 1962.

TIROS III master films for the period from launch through December 4, 1961, are on deposit at the:

National Weather Records Center  
U. S. Weather Bureau  
Arcade Building  
Asheville, North Carolina

Persons or institutions desiring copies may order them from the National Weather Records Center in the form of 35 mm. positive transparencies for projection, or 35 mm. duplication negatives from which opaque prints can be made. The pictures are stored chronologically on 100-foot reels. Orders must be placed for one or more reels, at a cost of \$6.00 each, as it is not now possible to furnish copies of individual frames or to provide enlargements or other picture formats. Reel number should be given when ordering. These film copies will be furnished without sprocket holes unless a specific request to the contrary is made when placing the order. Sprocketed copies are furnished at a cost of \$6.50 per reel, and are not suitable for movie projection.

A detailed description of the problems and uncertainties encountered in geographically locating TIROS pictures is contained in reference /1/.

A complete listing of satellite latitude, longitude, and height for all usable sequences, together with other information useful in determining precise location of TIROS III pictures, is contained in reference /2/. Detailed listings of picture-taking time for all frames are contained on the "TIROS III FRAME LOGS" which are on file at the Documentation Section, Meteorological Satellite Activities and will be available on microfilm from the National Weather Records Center for the cost of reproduction.

Latitude-longitude grids for overlay on TIROS III pictures have been computed for appropriate frames in virtually all usable TIROS III sequences. Microfilm copies of these grids are available from the National Weather Records Center for the cost of reproduction.



Available also from the National Weather Records Center for the cost of reproduction is a reel of microfilmed nephanalysis charts for TIROS I, II, and III. The TIROS III charts on this reel extend through December 4, 1961.

A catalogue describing the television cloud photography derived from TIROS I is now available from the Superintendent of Documents at the price of \$0.70 (Reference 137). Similar catalogues of TIROS II and TIROS IV television cloud photography will be prepared for publication during the fall of 1962.

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#### REFERENCES

1. L. F. Hubert: "TIROS I: Camera attitude data, analysis of location errors, and derivation of correction for calibration," Meteorological Satellite Laboratory Report No. 5, U. S. Weather Bureau, Washington, D. C., 1961.
2. L. F. Hubert: "Documentation for TIROS III Television Data." Meteorological Satellite Laboratory Report No. 9, U. S. Weather Bureau, Washington, D. C., 1962.
3. U. S. Weather Bureau: "Catalogue of Meteorological Satellite Data - TIROS I Television Cloud Photography," Key To Meteorological Records Documentation No. 5.31, Washington, D. C., 1961.



[illegible]



REEL	FILM LEGEND				PICTURE SEQUENCE DATA																					
					STARTING TIME	FRAME	GEOGRAPHICAL AREA COVERED																	LVBS		
	PASS	M	C	S	PASS MC DATE TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17
304	0171	T	1	W	0170 T1 0724	30	00	00																		0000
304	0172	T	1	W	0171 T1 0724	30	00	00																		0000
305	0173	T	2	W	0171 T 2 0724 085502	30	31	25						6					11							3000
305	0173	T	1	W	0172 T1 0724	30	00	00																		0000
305	0174	T	2	W	0173 T 2 0724 121152	30	26	10				4	5													0012
305	0174	T	1	W	0174 T1 0724	30	00	00																		0000
305	0174	D	1	W	0174 D1 0724 135418	30	00	00																		0000
352	0175	T	2	P	0174 T 2 0724 135548	30	30	24				4						10								3000
305	0183	T	2	W	0177 T 2 0724 191200	30	14	14									9				14				0220	
305	0184	T	2	W	0183 T 2 0725 044554	30	19	00							6	7									3000	
305	0185	T	2	W	0184 T 2 0725 065000	30	31	31												12	13			17	3010	
305	0186	T	1	W	0184 T1 0725	30	00	00																	0000	
305	0186	T	2	W	0185 T 2 0725	30	00	00																	0000	
305	0187	T	2	W	0186 T 2 0725 101128	30	32	32											11				16	17	3003	
305	0188	T	2	W	0187 T 2 0725 114942	30	32	32											10	11			16	17	0100	
353	0189	T	2	P	0188 T 2 0725 132108	30	32	22				4							10						3130	
353	0190	T	2	P	0189 T 2 0725 145527	30	27	12				4							10						3000	
353	0190	D	1	P	0190 D1 0725 164207	30	00	00																	0000	
305	0197	T	2	W	0191 T 2 0725 181931	30	25	13			2							9							1210	
305	0198	T	2	W	0197 T 2 0726 043050	30	31	29												12	13			17	1231	
305	0199	T	2	W	0198 T 2 0726 060744	30	31	22							6	7			11	12				17	3032	
305	0200	T	2	W	0199 T 2 0726 075810	30	31	31												12				17	3210	
353	0201	T	2	P	0200 T 2 0726 093250	30	31	31											11				16	17	3000	
353	0202	T	2	P	0201 T 2 0726 105808	30	00	00																	0000	
353	0203	D	2	P	0203 D 2 0726 141712	30	00	00																	0000	
353	0203	T	2	P	0202 T 2 0726 123325	30	06	00				4													1000	
353	0204	T	2	P	0203 T 2 0726 141954	30	17	00											10						1011	
305	0212	T	2	W	T 2	30	00	00																	0000	
306	0213	T	2	W	0212 T 2 0727 053723	30	31	24												12				17	0030	
306	0214	T	2	W	0213 T 2 0727 072006	30	31	29											11	12				17	3000	
306	0215	T	2	W	0214 T 2 0727 090000	30	31	27											11				16	17	3001	
353	0216	T	2	P	0215 T 2 0727 104230	30	31	31											11				16	17	3010	
353	0217	T	2	P	0216 T 2 0727 122100	30	00	00																	0000	
353	0218	T	2	P	0217 T 2 0727 140113	30	31	27											10				16		1032	
306	0226	T	2	W	0218 T 2 0727 152830	30	10	01									9	10							0000	
306	0227	T	2	W	0226 T 2 0728	30	00	00																	0000	
306	0228	T	2	W	0227 T 2 0728 064237	30	31	22											11	12				17	3000	
306	0229	T	2	W	0228 T 2 0728	30	00	00																	0000	
353	0230	T	2	P	0229 T 2 0728 100318	30	32	23											11				16	17	3033	
353	0230	T	1	P	0229 T1 0728	30	00	00																	0000	
353	0231	T	2	P	0230 T 2 0728 114139	30	31	16											10				16		2020	
353	0232	T	2	P	0231 T 2 0728	30	00	00																	0000	
353	0233	T	2	P	0232 T 2 0728 145244	30	13	00										9	10						1000	
306	0240	T	2	W	0233 T 2 0728 164000	30	23	06									9	10							0020	
306	0241	T	2	W	0240 T 2 0729	30	00	00																	0000	
306	0242	T	2	W	0241 T 2 0729	30	00	00																	0000	
306	0243	T	2	W	0242 T 2 0729	30	00	00																	0000	
354	0244	T	2	P	0243 T 2 0729 092954	30	31	23												11				16	17	3010
354	0245	T	1	P	0243 T1 0729	30	00	00																	0000	
354	0245	T	2	P	0244 T 2 0729	30	00	00																	0000	
354	0246	T	2	P	0245 T 2 0729 125049	30	31	21											10				15	16	0020	
354	0247	T	2	P	0246 T 2 0729 141620	30	09	00											10				15		1000	
306	0254	T	2	W	0247 T 2 0729	30	07	00																	0000	
306	0255	T	2	W	0254 T 2 0730 031727	30	00	00																	0000	
306	0256	T	2	W	0255 T 2 0730 050114	30	00	00																	0000	
306	0257	T	2	W	0256 T 2 0730 065444	30	00	00																	0000	
306	0258	T	2	W	0257 T 2 0730 084818	30	22	03											11						3020	
306	0259	D*	2	W	0258 T 2 0730 102512	30	13	01											10	11					3020	
354	0260	T	2	P	0259 T 2 0730 121111	30	24	12											10				16		1000	
354	0261	T	2	P	0260 T 2 0730 135102	30	30	11											10				15		3000	
306	0268	T	2	W	0261 T 2 0730	30	10	03												11				17	1000	
306	0269	T	2	W	0268 T 2 0731	30	00	00																	0000	
306	0270	T	2	W	0269 T 2 0731	30	00	00																	0000	
306	0271	T	2	W	0270 T 2 0731 064615	30	31	31												11	12			17	3333	
306	0272	T	2	W	0271 T 2 0731 082315	30	28	23												11			16	17	3230	
306	0273	T	2	W	0272 T 2 0731 094809	30	09	00											10	11			16		1030	
306	0273	D	1	W	0273 D1 0731 112930	30	00	00																	0000	
306	0274	T	2	P	0273 T 2 0731	30	00	00																	0000	
354	0275	T	2	P	0274 T 2 0731 132201	30	31	22											10				15	16	3332	
306	0282	T	2	W	0275 T 2 0731	30	00	00																	0000	
306	0283	T	2	W	0282 T 2 0801 025300	30	31	31									8				13				1333	
306	0284	T	2	W	0283 T 2 0801	30	00	00																	0000	
306	0285	T	2	W	0284 T 2 0801	30	00	00																	0000	
354	0286	T	2	P	0285 T 2 0801 074910	30	31	25												11			16	17	3110	
354	0287	T	2	P	0286 T 2 0801 092832	30	31	22												11			16	17	0330	
354	0288	T	2	P	0287 T 2 0801 110852	30	31	25															15	16	0010	
354	0289	T	2	P	0288 T 2 0801 124938	30	31	24												10			15			

REEL	FILM LEGEND				PICTURE SEQUENCE DATA																									
					STARTING TIME				FRAME			GEOGRAPHICAL AREA COVERED																	LVBS	
	PASS	M	C	S	PASS	MC	DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
306	0297	T	2	W	0296	T	2	0802	012835	30	00	00																	0000	
306	0298	D	1	W	0298	D	1	0802	045645	10	00	00																	0000	
306	0298	T	2	W	0297	T	2	0802		30	00	00																	0000	
306	0299	T	2	W	0298	T	2	0802	045845	30	00	00																	0000	
354	0300	T	2	P	0299	T	2	0802		30	00	00																	0000	
354	0301	T	2	P	0300	T	2	0802		30	00	00																	0000	
354	0302	T	1	P	0301	T	1	0802		30	00	00																	0000	
354	0302	T	2	P	0301	T	2	0802	103937	30	31	31															16	17	0032	
354	0303	T	2	P	0302	T	2	0802	122008	30	31	31														15	16		1032	
306	0311	T	2	W	0303	T	2	0802	140000	30	31	31														14	15	16	3330	
306	0312	T	2	W	0311	T	2	0803	032020	30	31	21												13				17	0130	
307	0313	T	2	W	0312	T	2	0803	052430	30	08	08								9				13	14				0010	
307	0313	D	1	W	0313	D	1	0803	061100	10	00	00																	0000	
307	0314	T	2	W	0313	T	2	0803	064526	30	31	27												13				17	1331	
354	0315	T	2	P	0314	T	2	0803		30	00	00																	0000	
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355	0317	T	2	P	0316	T	2	0803		30	00	00																	0000	
307	0325	D	1	W	0325	D	1	0804	020031	10	00	00																	0000	
307	0325	T	2	W	0319	T	2	0803	130146	30	00	00																	0000	
307	0326	D	1	W	0326	D	1	0804	034700	10	00	00																	0000	
307	0326	T	2	W	0325	T	2	0804	024238	30	23	06																17	0033	
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355	0332	T	2	P	0331	T	2	0804	125138	30	31	18															15	16		1120
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307	0342	T	2	W	0341	T	2	0805	053308	30	25	08																	17	0030
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355	0344	T	2	P	0343	T	2	0805	091408	30	15	15																	17	0030
355	0345	T	2	P	0344	T	2	0805	103408	30	29	11																		0033
355	0345	T	1	P	0345	T	1	0805		30	00	00																		0000
355	0346	T	2	P	0345	T	2	0805	121618	30	31	14																	16	0010
307	0353	T	2	W	0348	T	2	0805	172142	30	31	20															14	15		0220
307	0354	T	2	W	0353	T	2	0806	014123	30	31	22																	17	0030
307	0355	T	2	W	0354	T	2	0806	032650	30	31	31																	17	0220
307	0356	T	2	W	0355	T	2	0806	050817	30	31	31																	17	0231
355	0357	T	2	P	0356	T	2	0806	071250	30	00	00																		0000
355	0357	T	1	P	0356	T	1	0806		30	00	00																		0000
355	0358	T	2	P	0357	T	2	0806	082814	30	31	30																	17	1000
355	0359	T	2	P	0358	T	2	0806	095244	30	16	01																		0000
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356	0372	T	2	P	0371	T	2	0807	075802	30	12	11																	17	1000
356	0373	T	2	P	0372	T	2	0807	093305	30	31	31																	16	0320
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REEL	FILM LEGEND	PICTURE SEQUENCE DATA																							
		STARTING TIME				FRAME	GEOGRAPHICAL AREA COVERED																	LVBS	
	PASS M C S	PASS MC DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
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311	0552	D	2	W	0552	D	2	0819	213650	10	21	19													1130
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311	0553	T	2	W	0552	T	2	0819	230100	30	30	30													3033
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312	0581	T	2	W	0581	T	2	0821	215523	30	29	30													3003
312	0582	T	2	W	0582	T	2	0821	233500																



REEL	FILM LEGEND	PICTURE SEQUENCE DATA																									
		STARTING TIME				FRAME			GEOGRAPHICAL AREA COVERED																LVBS		
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362	0794	T	2	P	0793	T	2	0905	163244	30	27	27															3330
316	0795	T	2	W	0794	T	2	0905	182020	30	29	29															1330
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362	0797	T	2	P	0797	T	2	0905	231934	30	30	30															3210
362	0798	T	2	P	0798	T	2	0906	005656	30	30	29															3130
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316	0809	T	2	W	0809	T	2	0906	192031	30	28	24															2010
316	0809	D	2	W	0809	D	2	0906	194140	10	27	27															0030
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363	0811	T	2	P	0811	T	2	0906	224334	30	30	30															2000
363	0812	D	2	P	0812	D	2	0907	004220	10	25	25															3030
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316	0822	T	2	W	0821	T	2	0907	153951	30	28	28															3020
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REEL		FILM LEGEND				PICTURE SEQUENCE DATA																	LVBS						
		PASS	M	C	S	STARTING TIME				FRAME			GEOGRAPHICAL AREA COVERED																
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367	0995	D	2	P	0995	D	2	0919	183919	10	03	03			3														0000
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367	1005	D	2	P	1005	D	2	0920			00	00																	0000
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367	1008	T	2	P	1007	T	2	0920	144400	30	29	29					4	5											1330
367	1009	D	2	P	1009	D	2	0920	180147	10	13	13			3						9								0000
367	1009	T	2	P	1008	T	2	0920	162430	30	26	26			3	4					10								3030
367	1010	T	2	P	1009	T	2	0920	181030	30	29	29			3	4					10								3030
367	1010	D	2	P	1010	D	2	0920	195120	10	15	15			3						9								0000
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367	1021	T	2	P	1020	T	2	0921	122730	30	29	29					5					11							3030
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368	1024	T	2	P	1023	T	2	0921	173530	30	25	25					4				10								3000
368	1024	D	2	P	1024	D	2	0921	191520	10	21	21				3													0000
320	1032	T	2	W																									



REEL	FILM LEGEND				PICTURE SEQUENCE DATA																								
					STARTING TIME				FRAME			GEOGRAPHICAL AREA COVERED																	LVBS
	PASS	M	C	S	PASS	MC	DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
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370	1109	T	2	P	1108	T	2	0927	154600	30	30	30			3	4					10								2030
321	1119	T	2	W	1112	T	2	0927	221700	30	25	18	1	2					8										1232
322	1120	T	2	W	1119	T	2	0928	100800	30	27	27				5	6					11							3020
322	1121	T	2	W	1120	T	2	0928	114830	30	29	29				5					10	11							0032
370	1122	T	2	P	1121	T	2	0928	132900	30	30	30				4					10								3030
322	1134	T	2	W	1127	T	2	0928	233100	30	29	24	1						8										0020
322	1135	T	2	W	1134	T	2	0929	111300	30	29	23				5	6					11							0010
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322	1150	T	2	W	1149	T	2	0930	122400	30	30	27									10	11					16		3000
370	1151	T	2	P	1150	T	2	0930	140330	30	26	28									10								3000
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322	1160	T	2	W	1159	T	2	1001	051730	30	28	28											12	13				17	0000
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370	1164	T	2	P	1163	T	2	1001	115500	30	25	25									10	11					16		1000
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REEL	FILM LEGEND	PICTURE SEQUENCE DATA																					
		STARTING TIME				FRAME			GEOGRAPHICAL AREA COVERED												LVBS		
	PASS M C S	PASS MC DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16
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325	1317 T 2 W	1316 T 2 1012	041030	30	27	27								8					13				0330
325	1318 T 2 W	1317 T 2 1012	055300	30	24	24								8					13				3003
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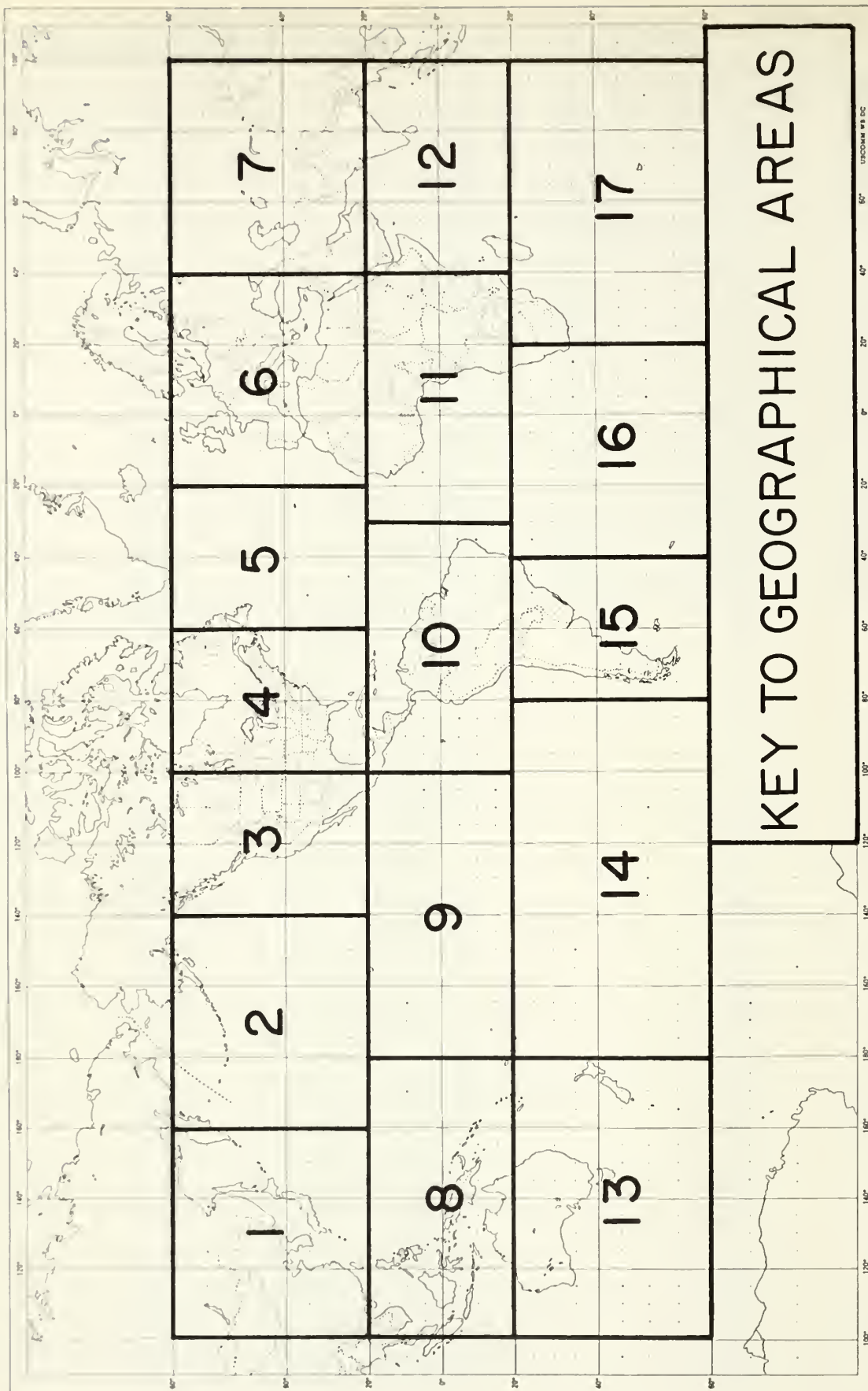
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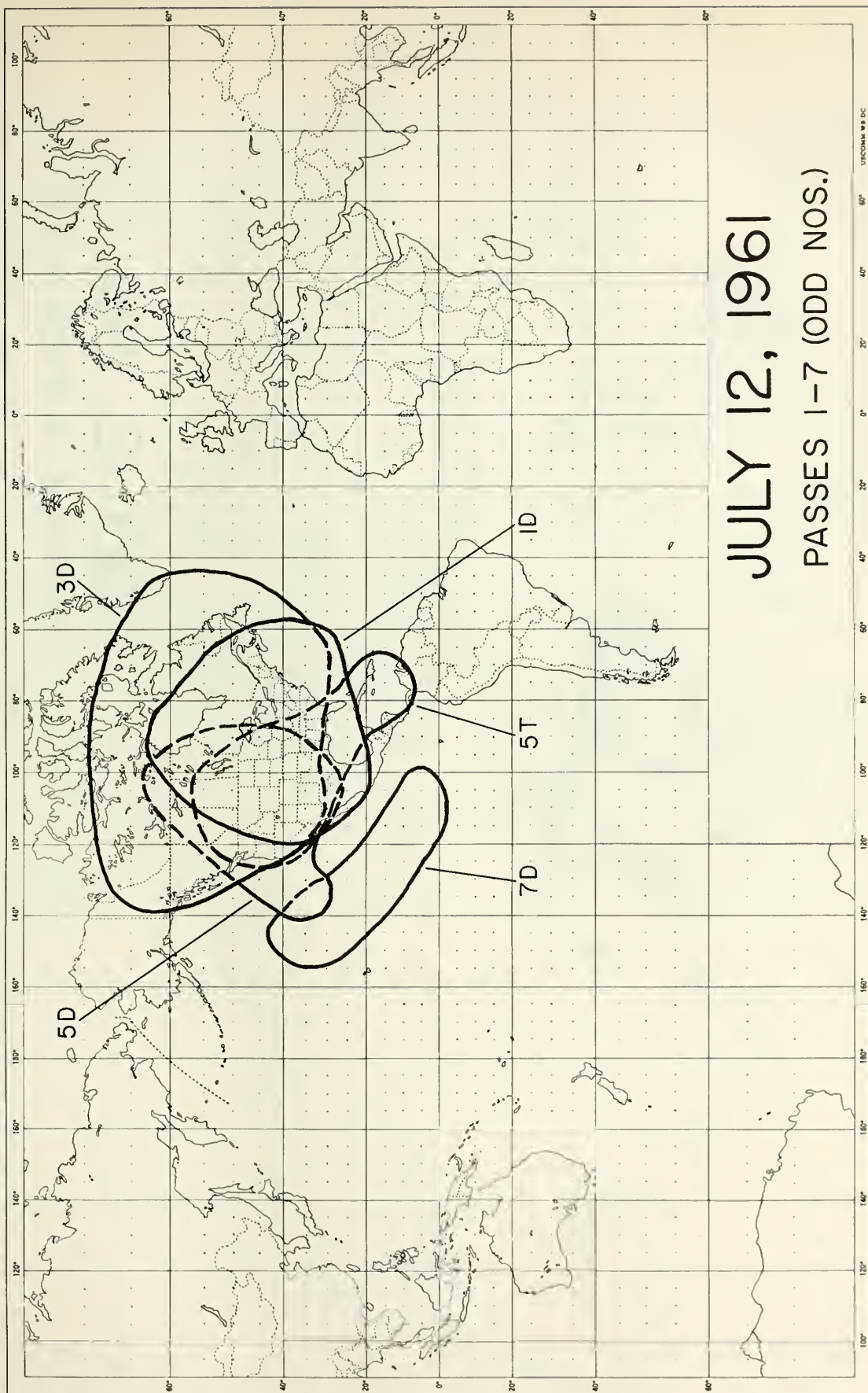
REEL	FILM LEGEND	PICTURE SEQUENCE DATA																						
		STARTING TIME				FRAME	GEOGRAPHICAL AREA COVERED																	LVBS
	PASS M C S	PASS MC DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
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335	1897 T 2 W	1896 T 2 1121	130924	30	21	21					5	6												0001
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335	1909 T 2 W	1908 T 2 1122	092500	30	18	18							7					12						3000
335	1910 T 2 W	1909 T 2 1122	111130	30	05	05						6					11	12						0000
335	1911 T 2 W	1910 T 2 1122	123501	30	19	19				4	5	6												1010
380	1914 T 2 P	1913 T 2 1122	174330	30	18	18				4						10								0000
380	1914 D 2 P	1914 D 2 1122	193124	10	00	00																		0000
380	1915 T 2 P	1914 T 2 1122	193200	30	21	25										10								0000
335	1922 T 2 W	1919 T 2 1123	034430	30	08	08	1							7	8									0000
336	1923 T 2 W	1922 T 2 1123	085000	30	18	18							6	7				12						3000
336	1924 T 2 W	1923 T 2 1123	103730	30	14	23							6	7										3000
336	1925 T 2 W	1924 T 2 1123	115930	30	24	24						5	6											1000
360	1927 T 2 P	1925 T 2 1123	134828	30	12	21						5												0020
360	1927 T 2 P	1927 T 2 1123	170845	30	00	00																		0000
360	1928 T 2 P	1927 T 2 1123	170915	30	02	15				4						10								0000
336	1937 T 2 W	1933 T 2 1124	031140	30	16	23	1								8									3000
336	1938 T 2 W	1937 T 2 1124	094430	30	19	19						5	6											3000
336	1939 T 2 W	1938 T 2 1124	112500	30	18	21						5	6				11							3000
360	1942 T 2 P	1940 T 2 1124	144630	30	10	19					4	5												0120
380	1942 T 2 P	1942 T 2 1124	181602	30	00	00																		0000
380	1943 T 2 P	1942 T 2 1124	181732	30	12	19				4						10								3000
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336	1952 T 2 W	1951 T 2 1125	092200	30	28	28		</																

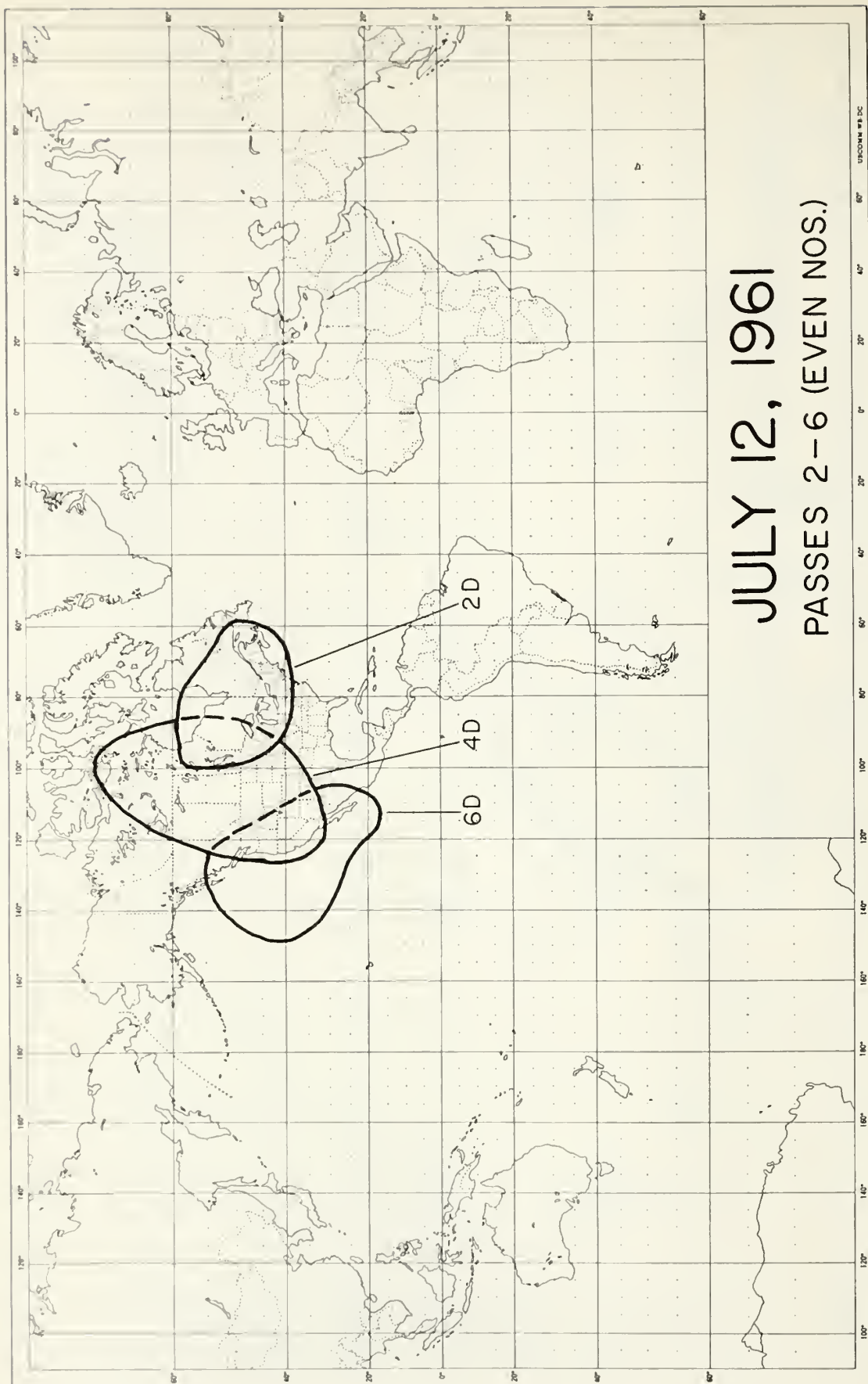


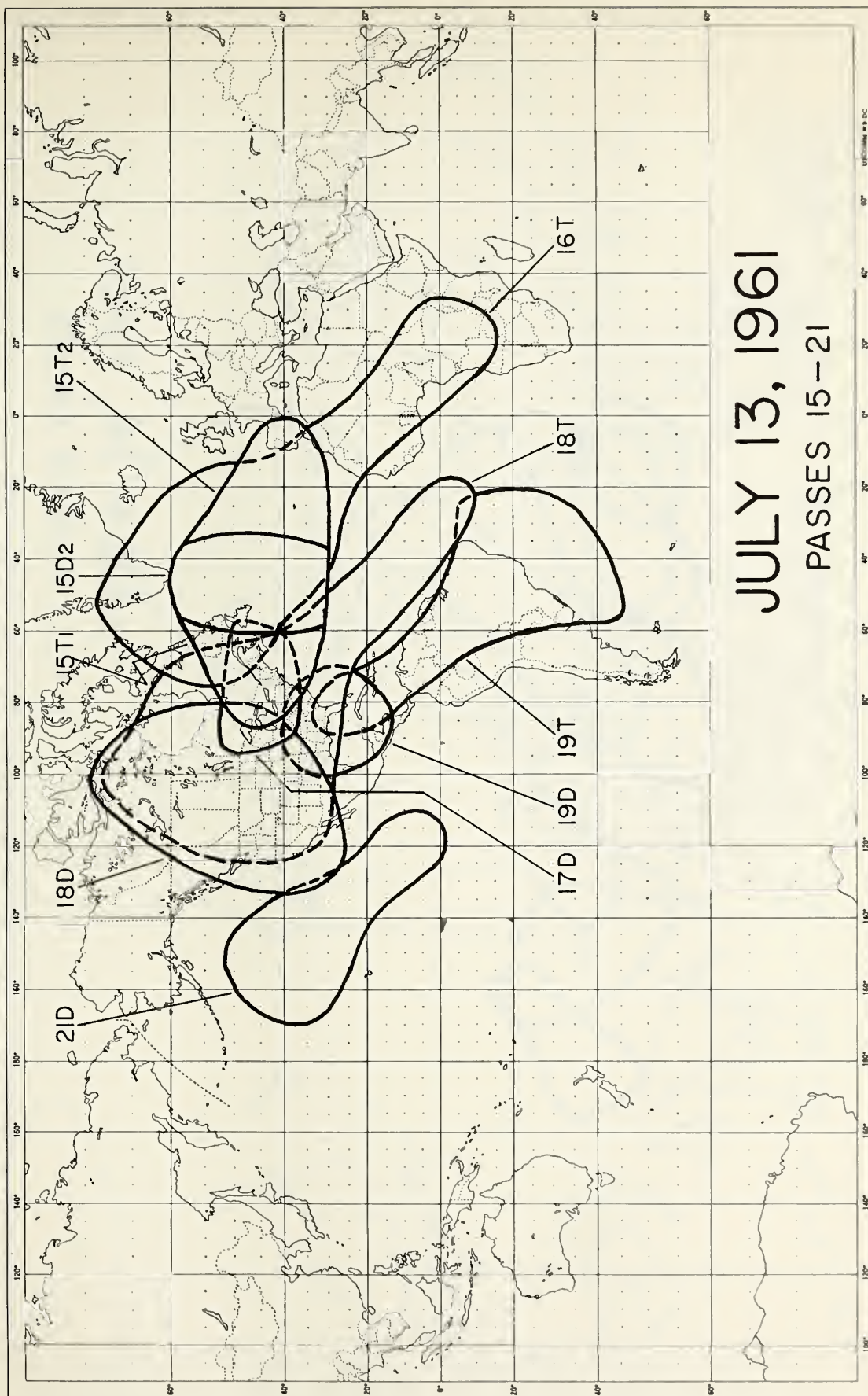
REEL	FILM LEGEND				PICTURE SEQUENCE DATA																								
					STARTING TIME				FRAME		GEOGRAPHICAL AREA COVERED															LVBS			
	PASS	M	C	S	PASS	MC	DATE	TIME	TI	US	+	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
338	2081	T	2	W	2080	T	2	1204	092000	30	27	27										11						17	1000
381	2504	D	2	P	2504	D	2	0102	213548	10	00	10		3															1000
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381	2560	D	2	P	2560	D	2	0106	191250	10	00	03		3															0000
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382	2576	D	2	P	2576	D	2	0107	220650	10	00	07		3															2000
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382	2604	D	2	P	2604	D	2	0109	205645	10	00	01		3															0000
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382	2702	D	2	P	2702	D	2	0116	164350	10	00	00		3															3000
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382	2732	D	2	P	2732	D	2	0118	190354	10	00	00		3															0000
382	2733	D	2	P	2733	D	2	0118	204948	10	00	00		3															0000
382	2761	D	2	P	2761	D	2	0120	193848	10	00	00																	0000
382	2762	D	2	P	2762	D	2	0120	212250	10	00	00																	0000
382	2775	D	2	P	2775	D	2	0121	190050	10	00	00																	0000
382	2776	D	2	P	2776	D	2	0121	204650	10	00	00																	0000
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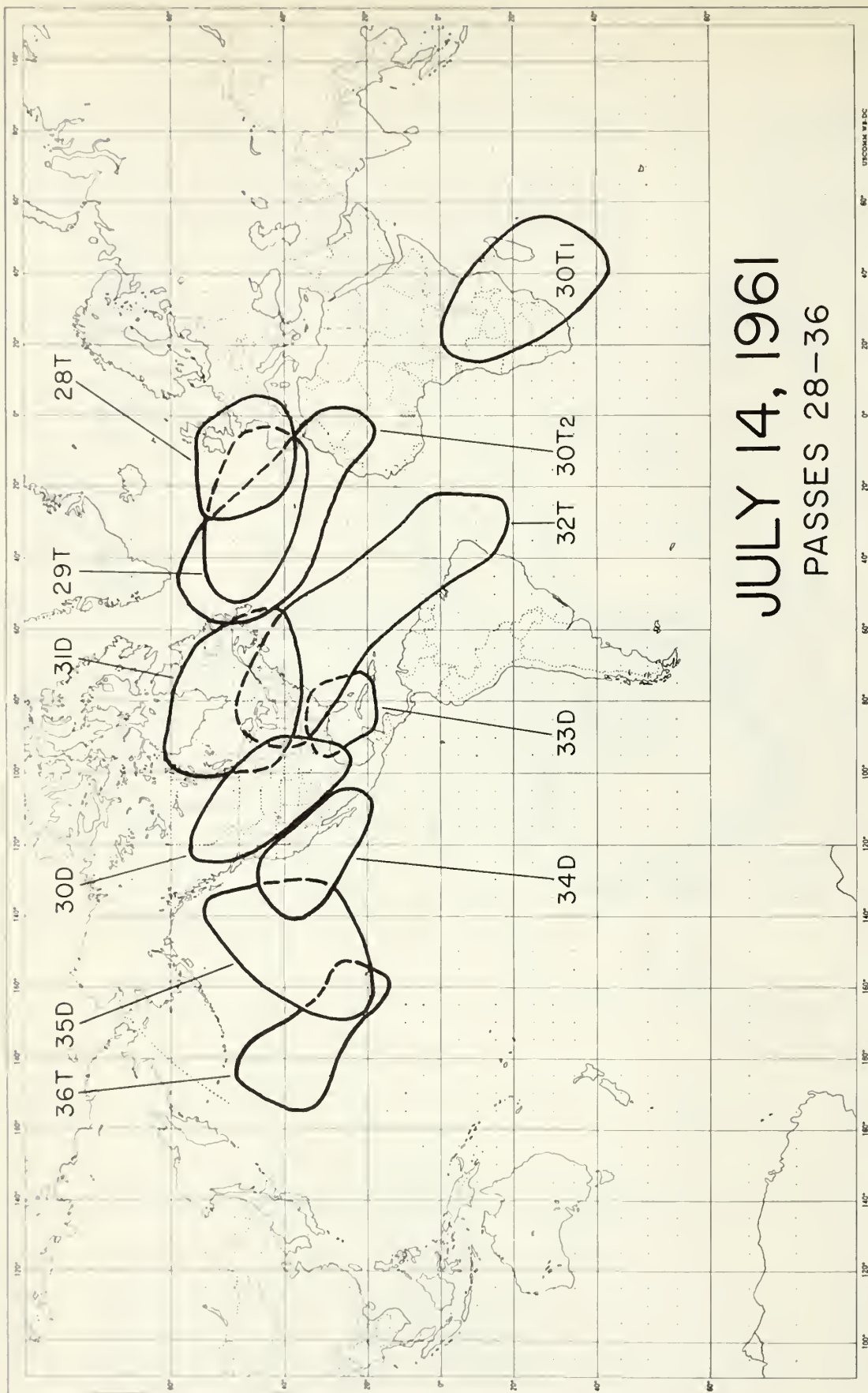


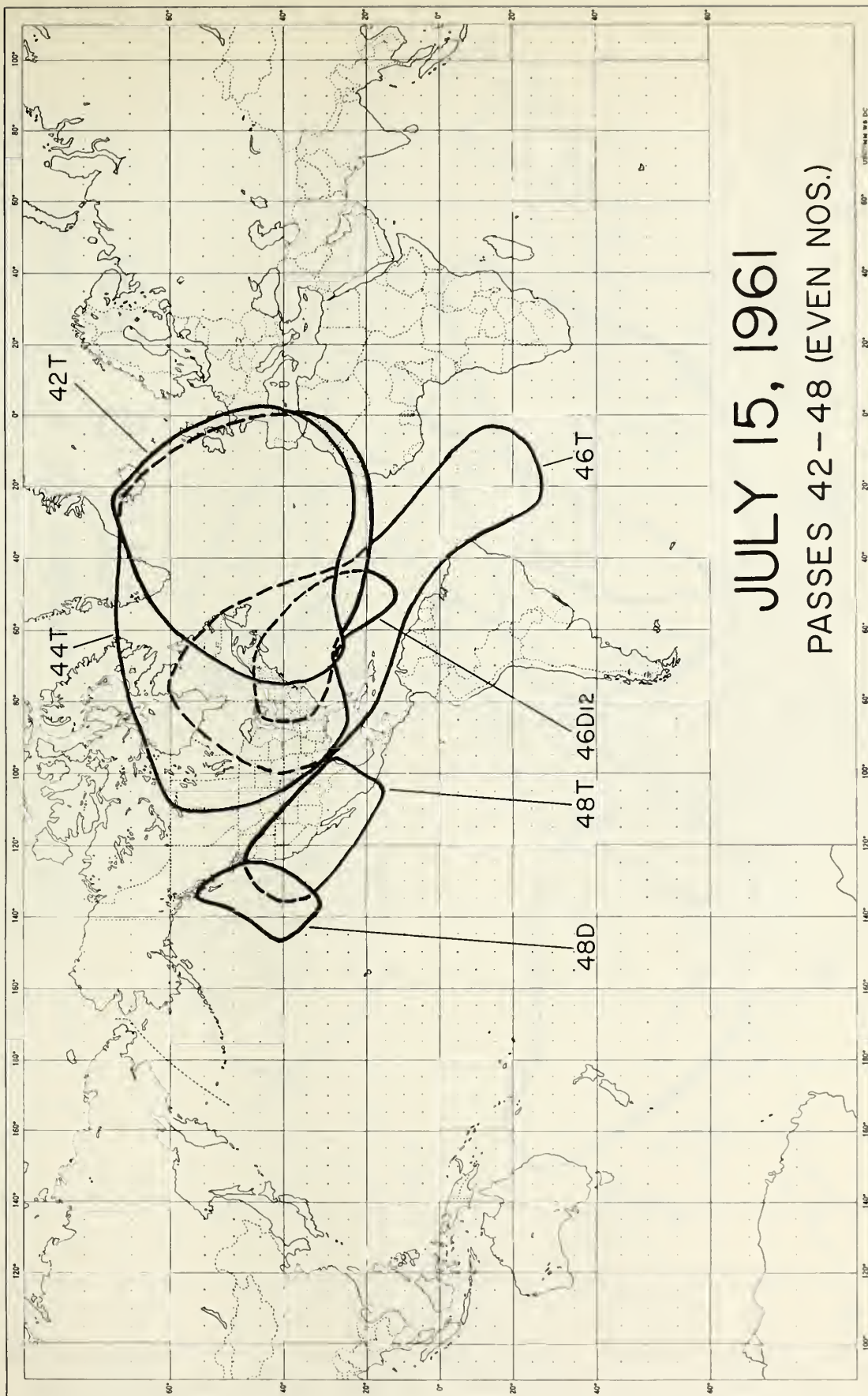


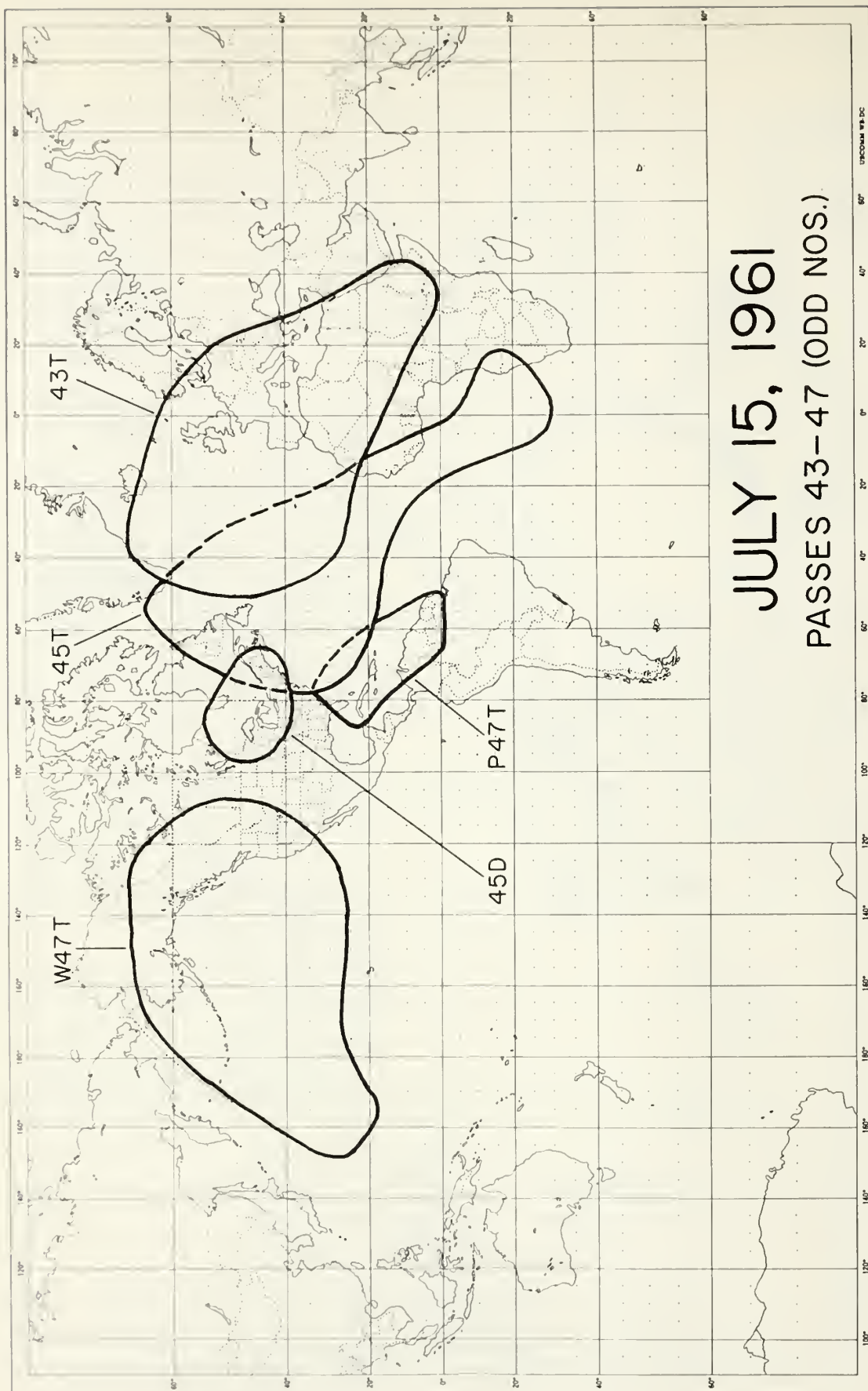




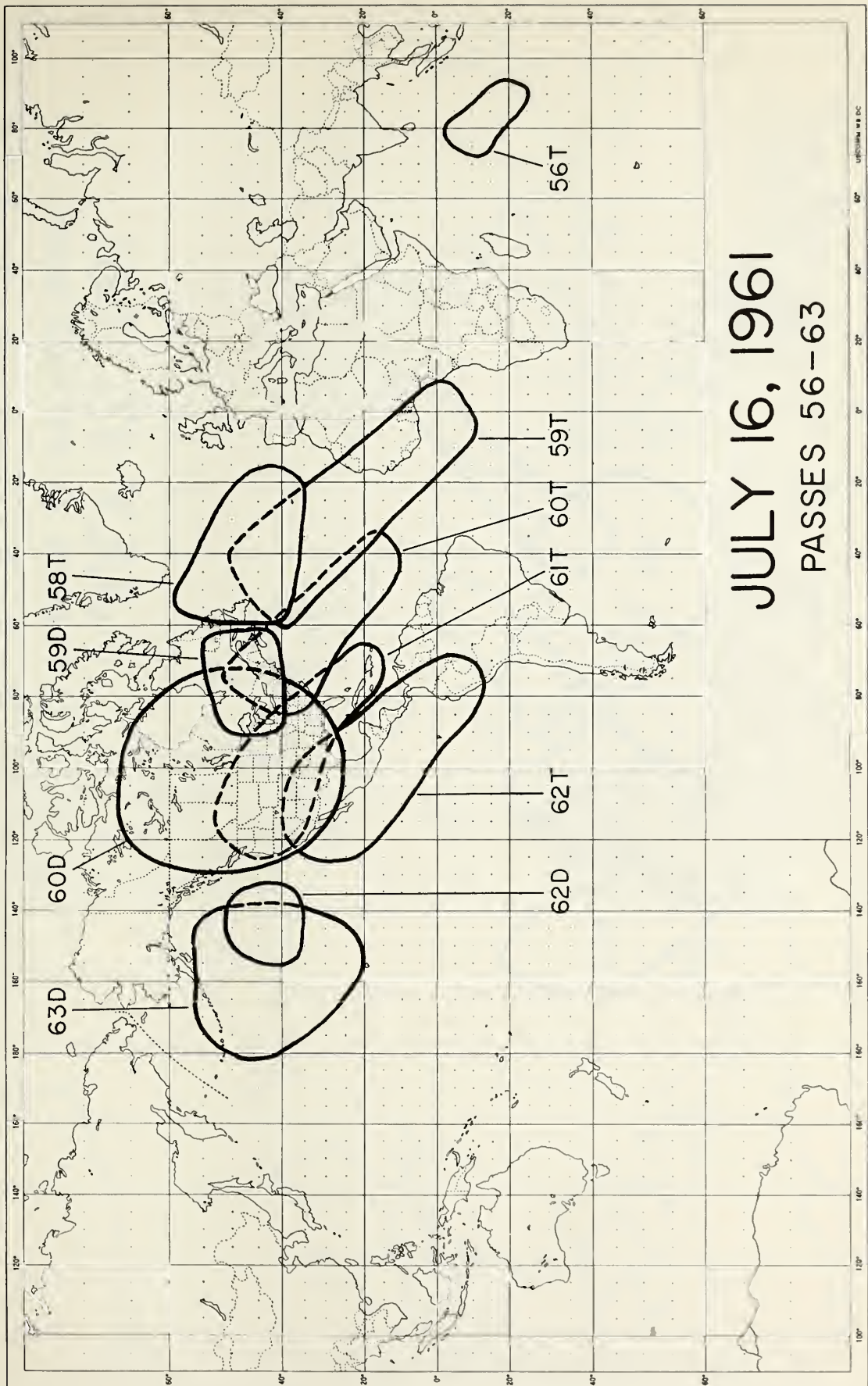


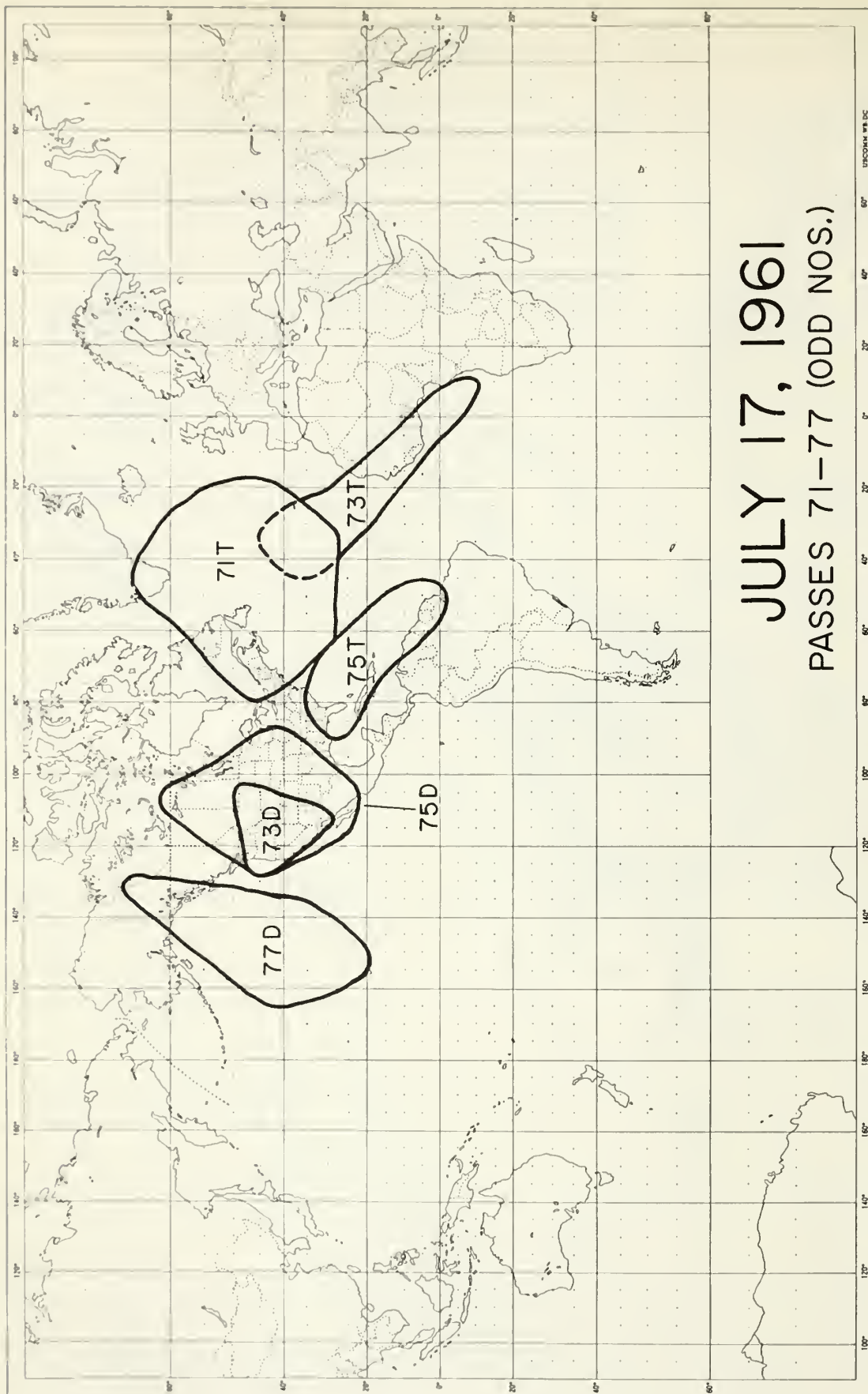




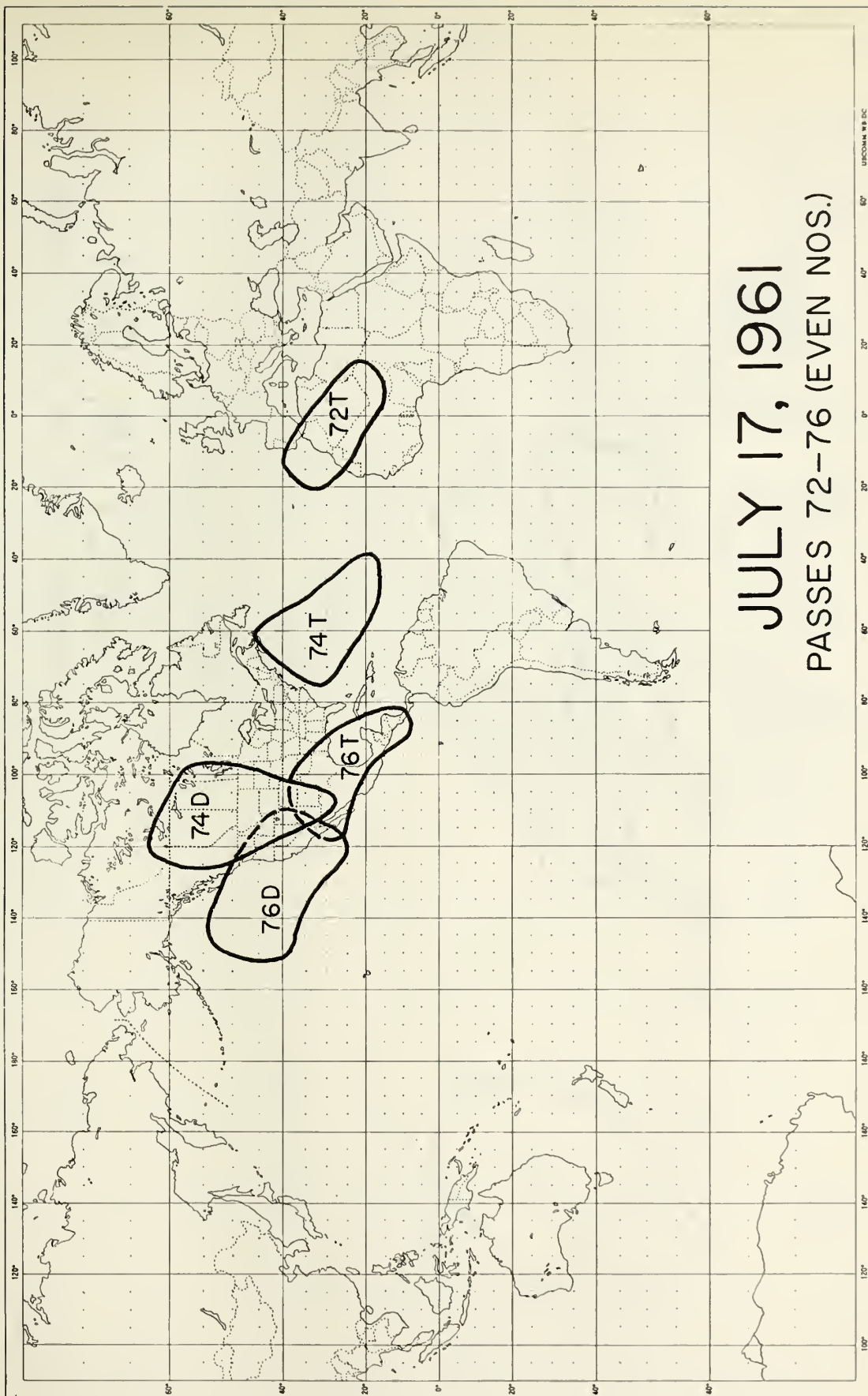


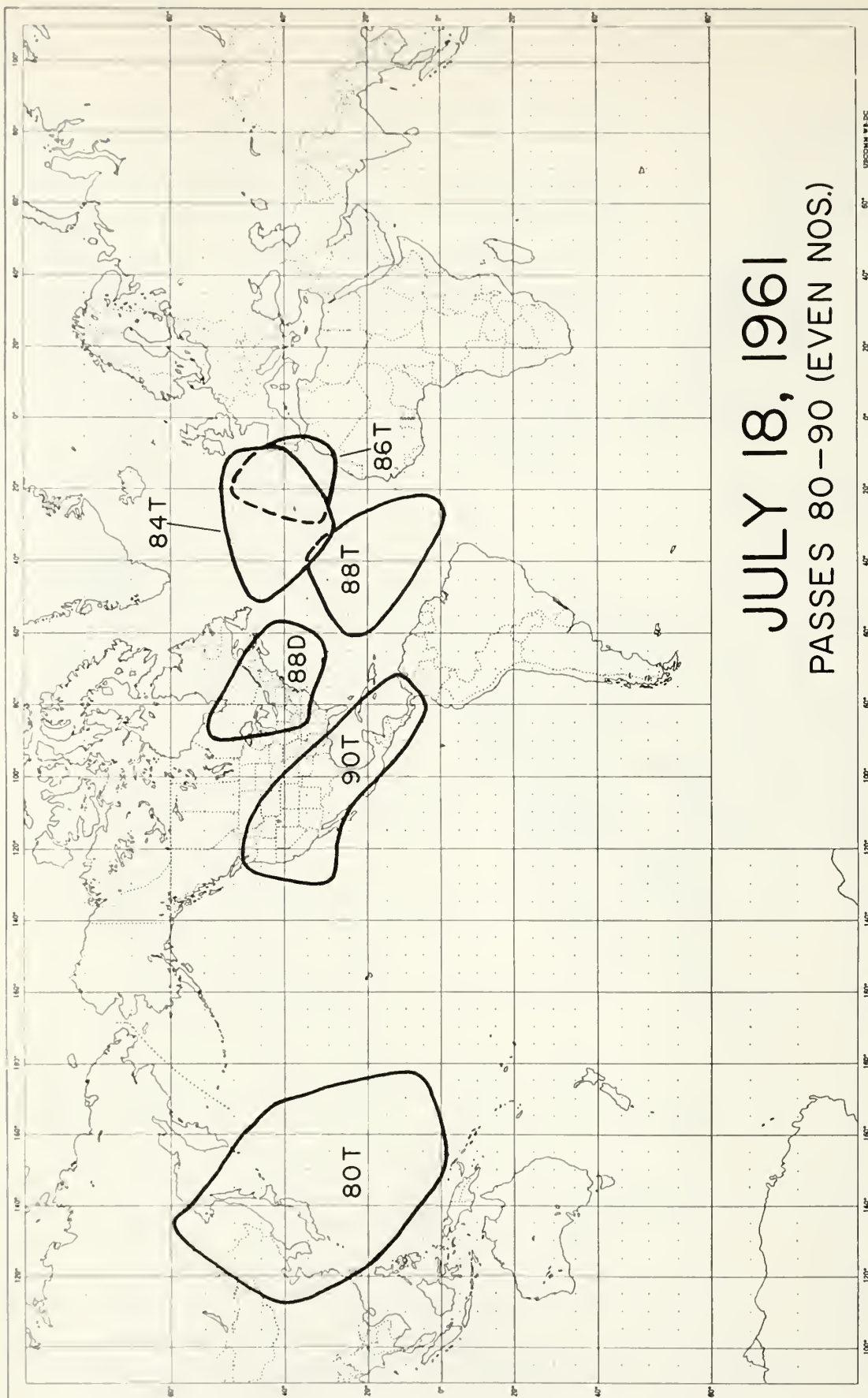


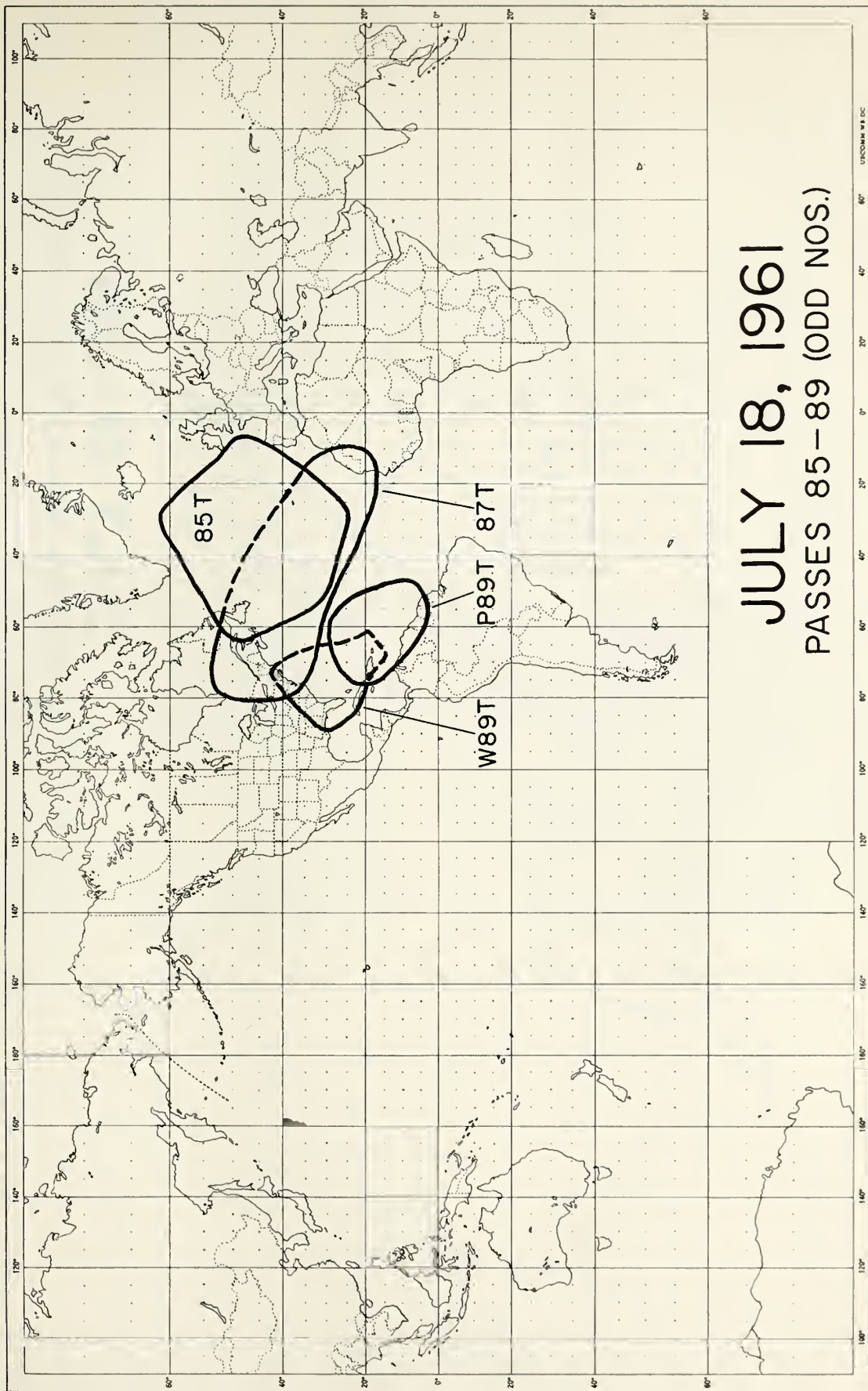




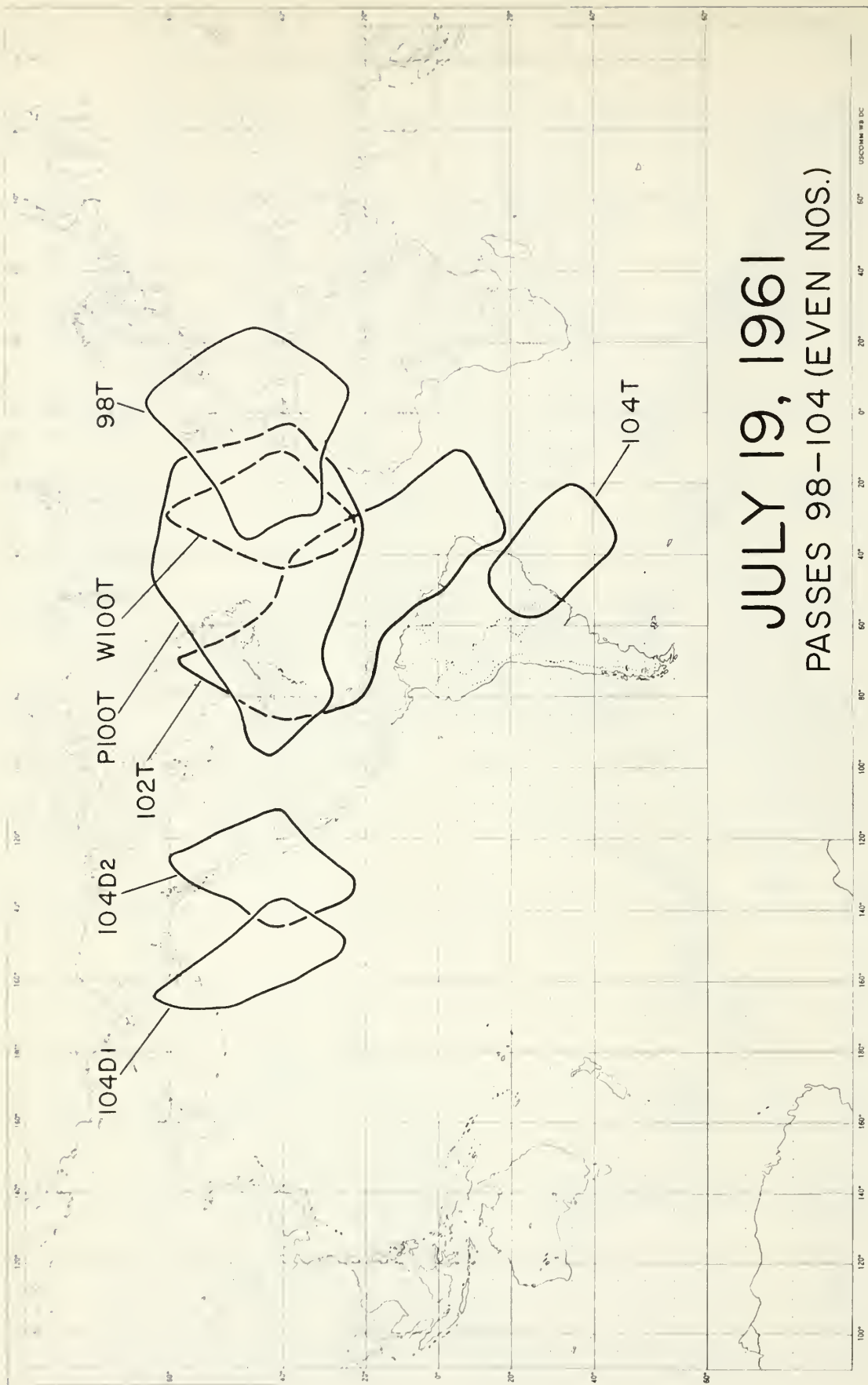


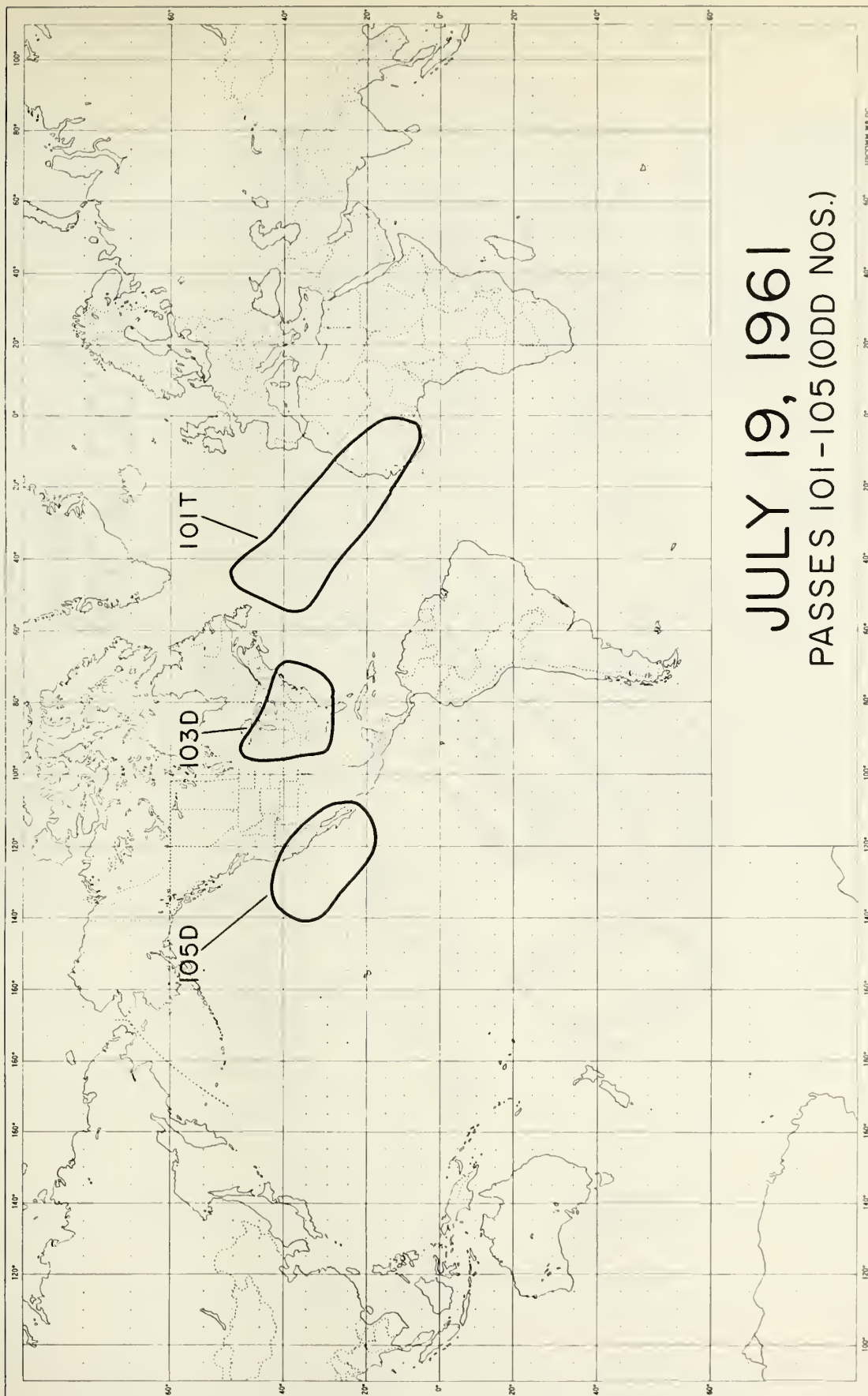


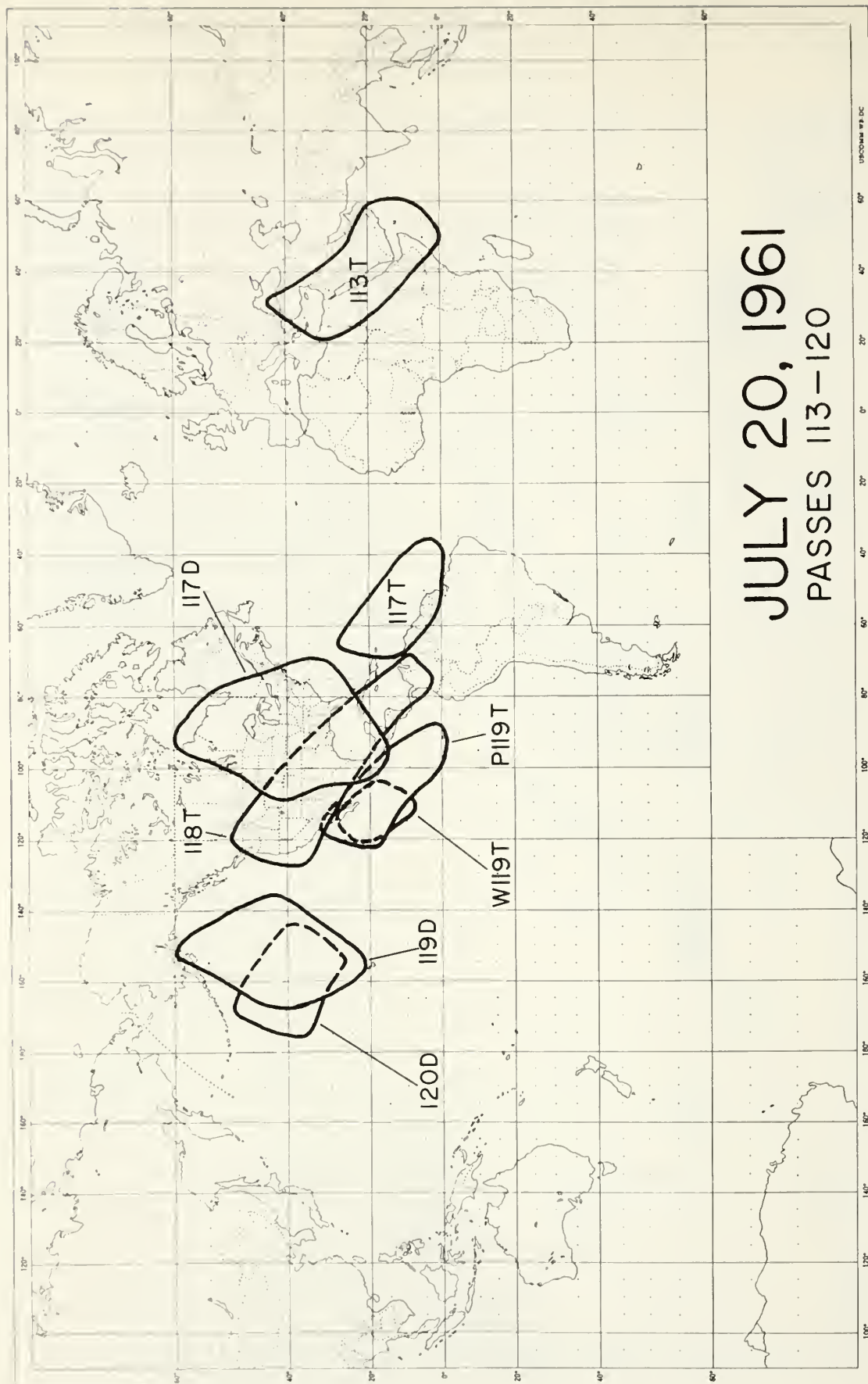






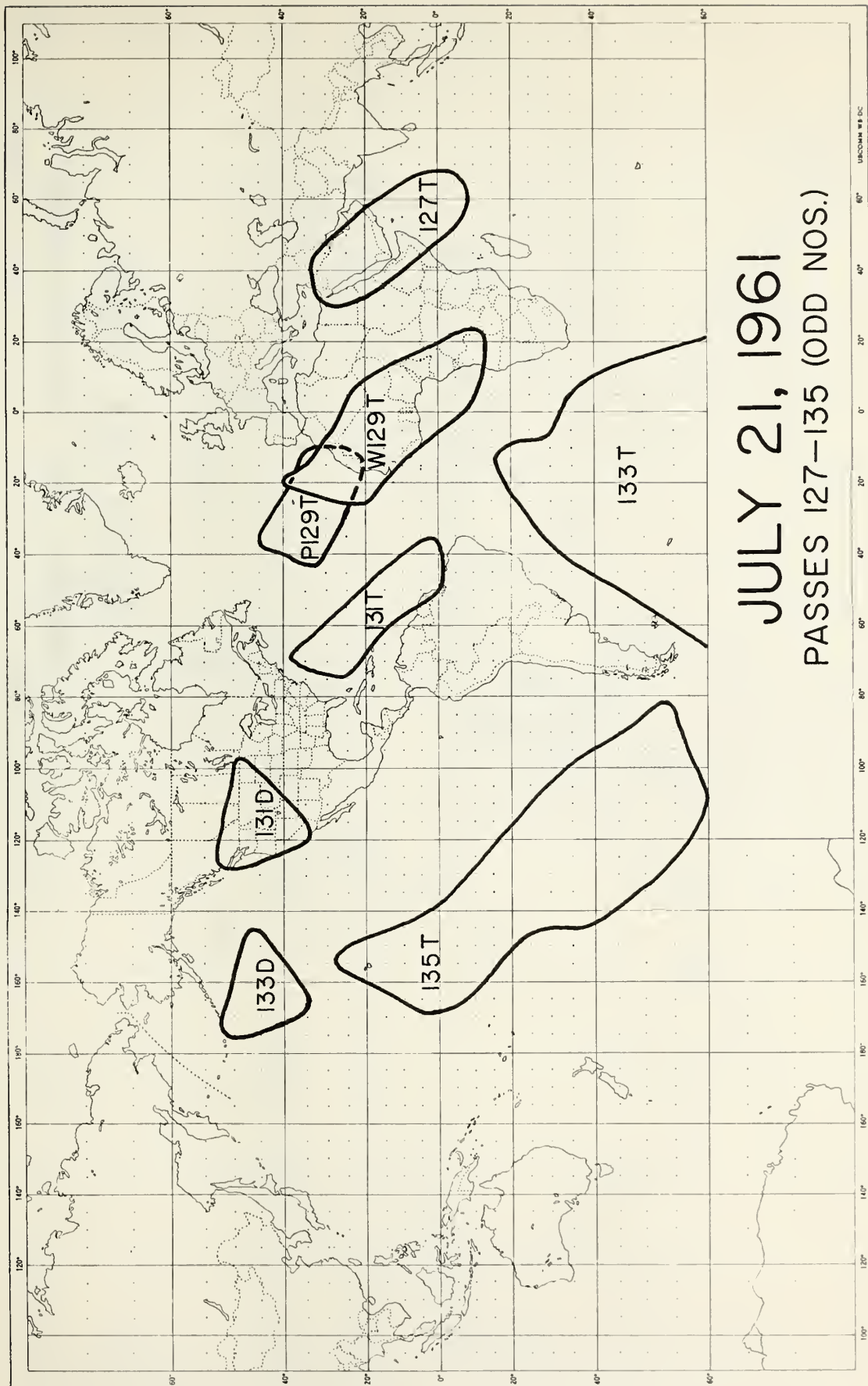


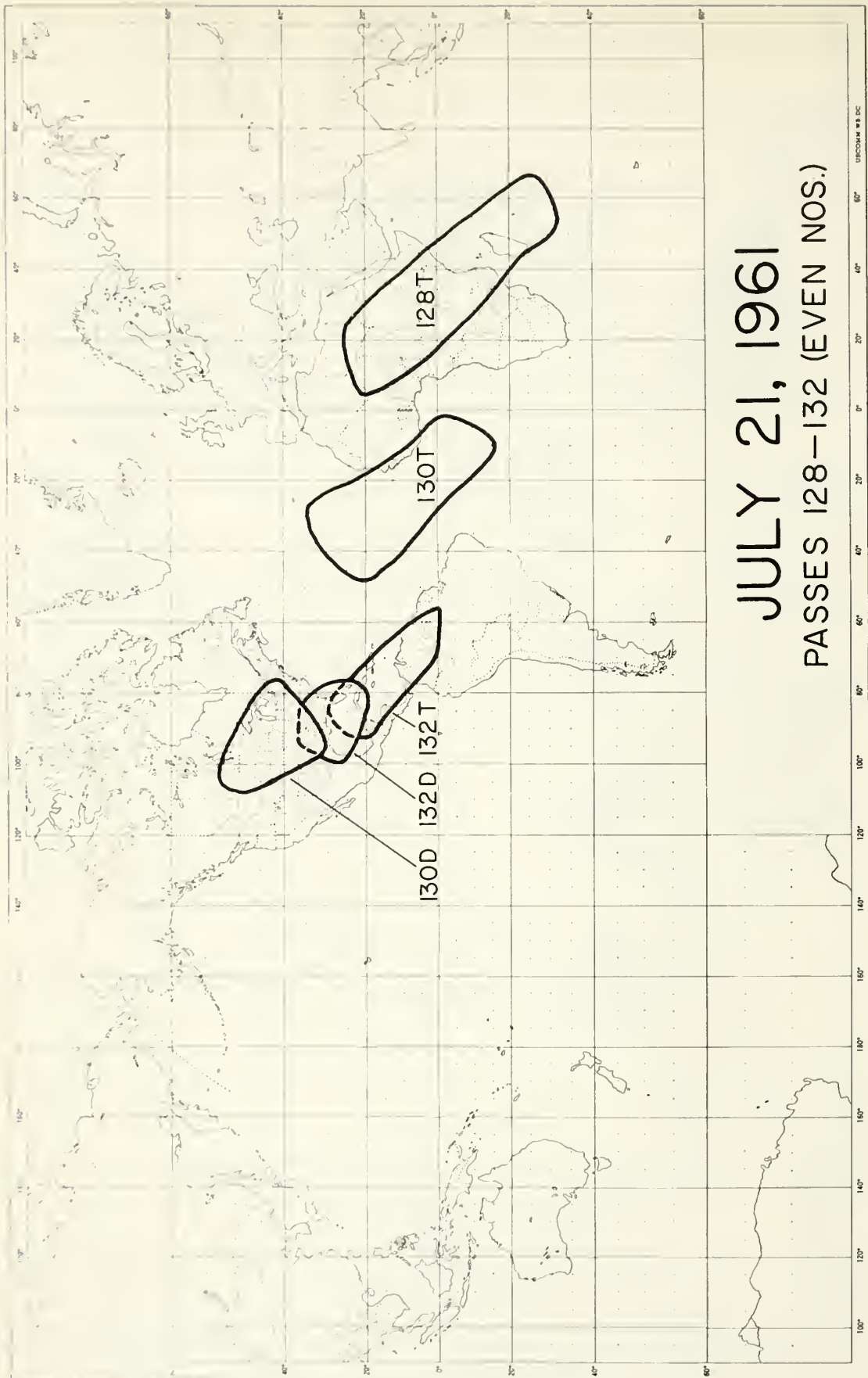


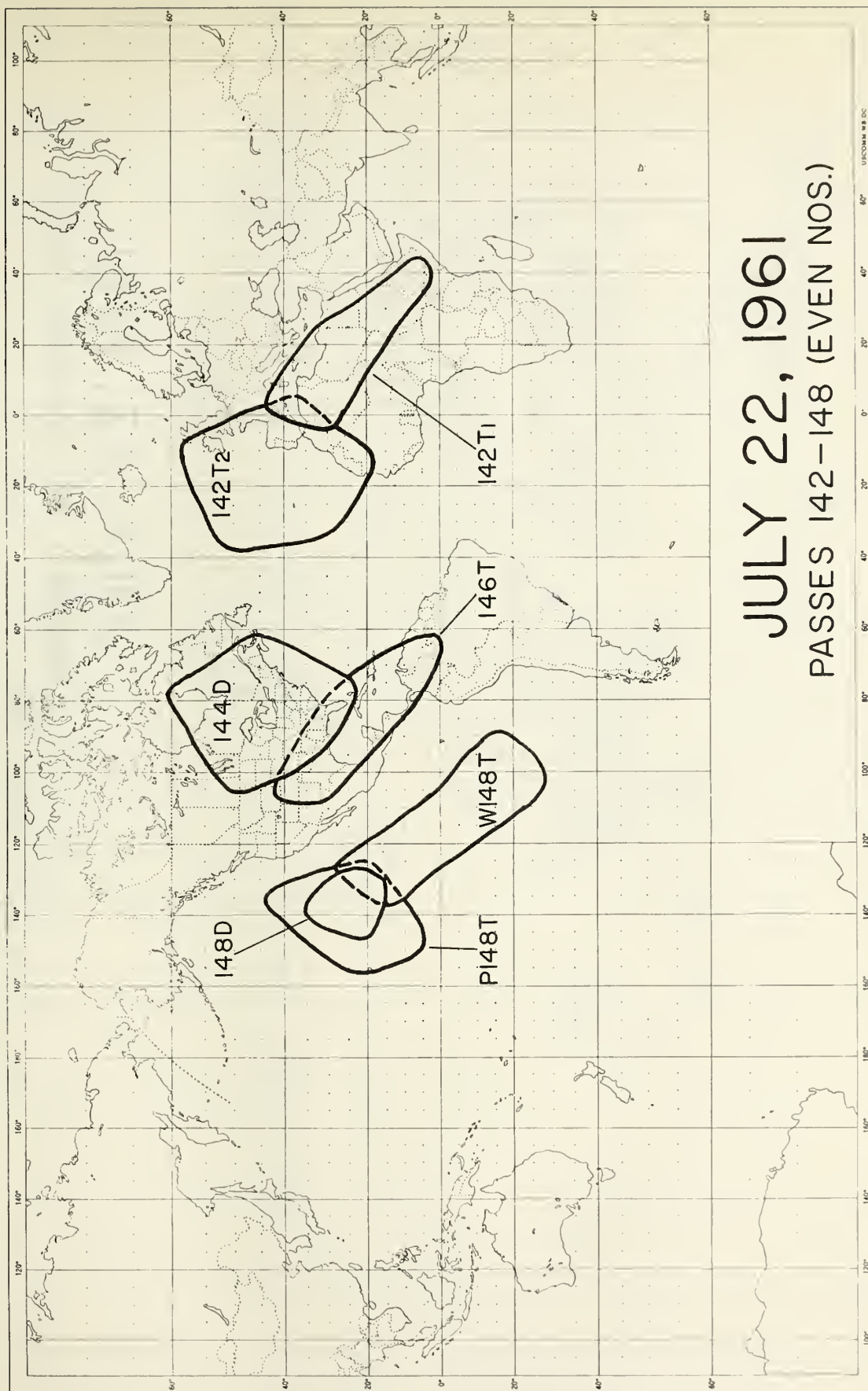


JULY 20, 1961  
PASSES 113-120

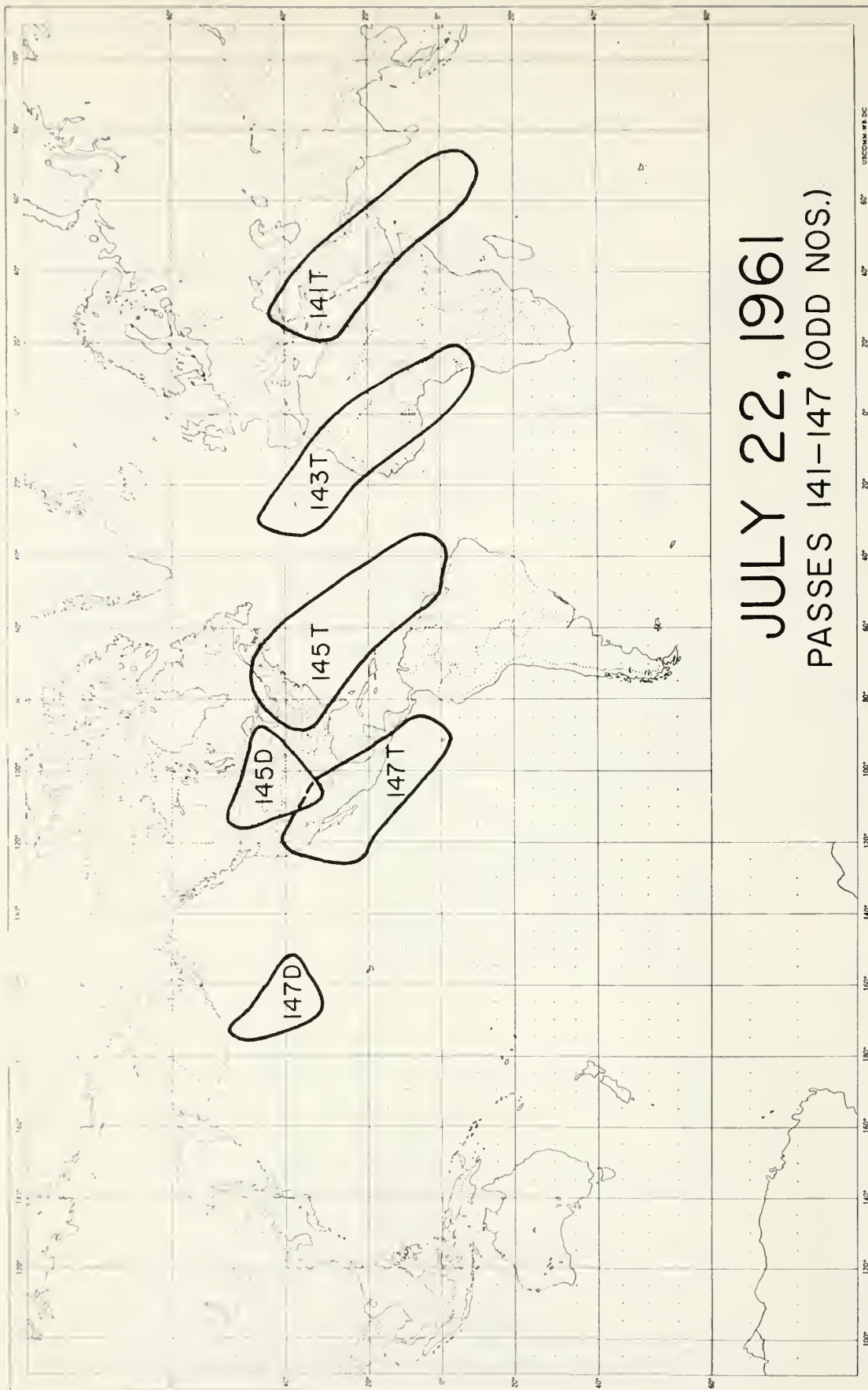


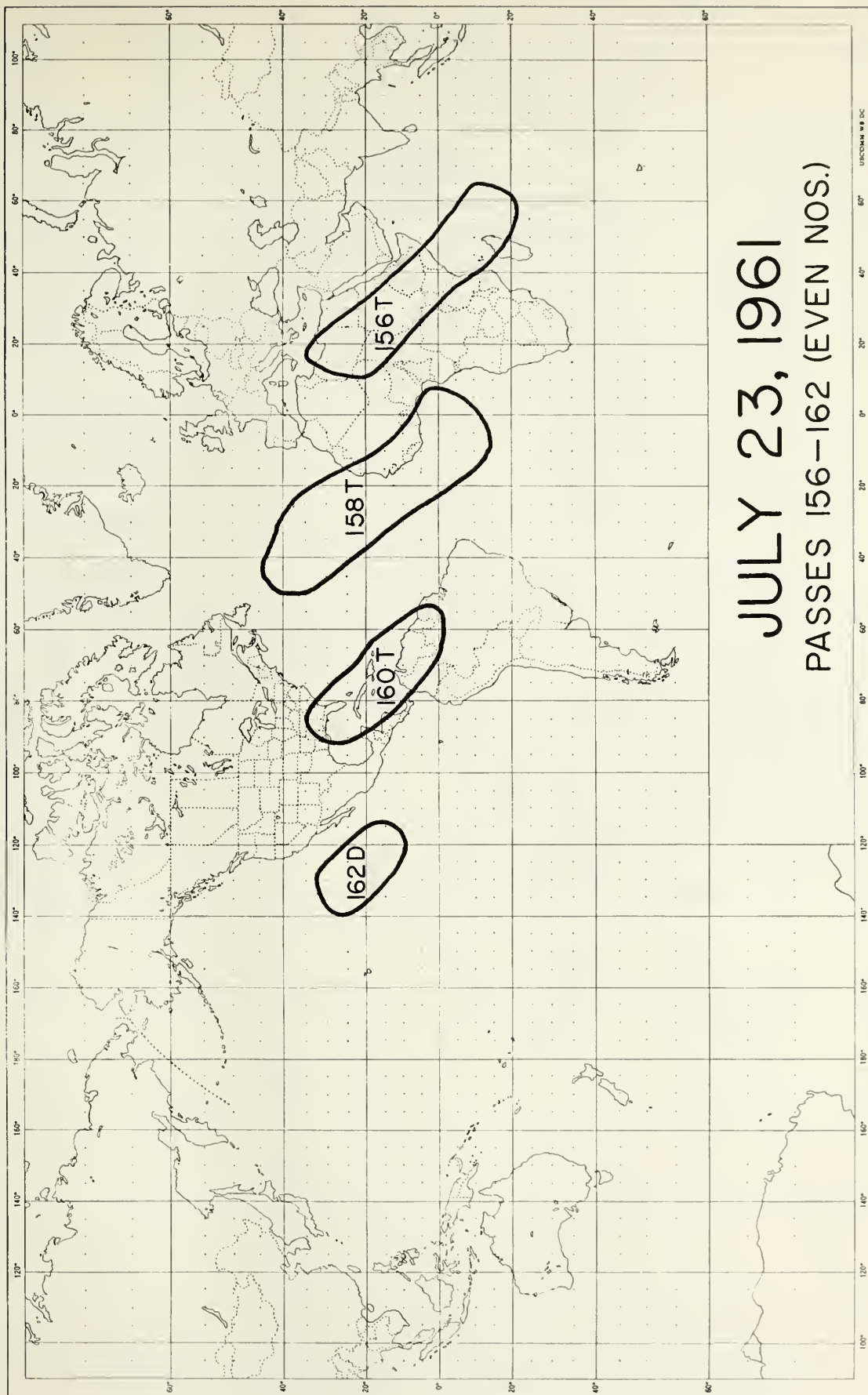






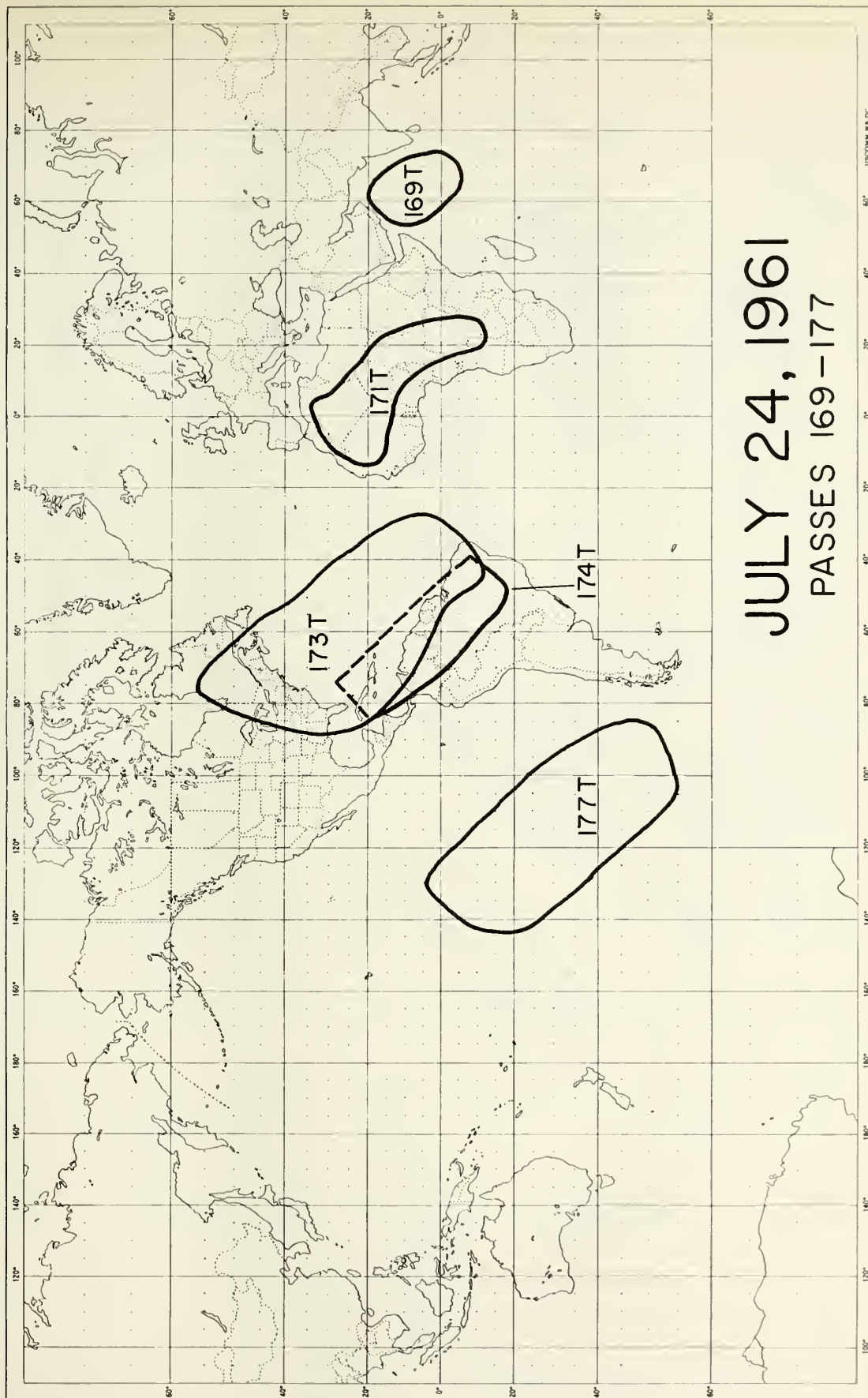


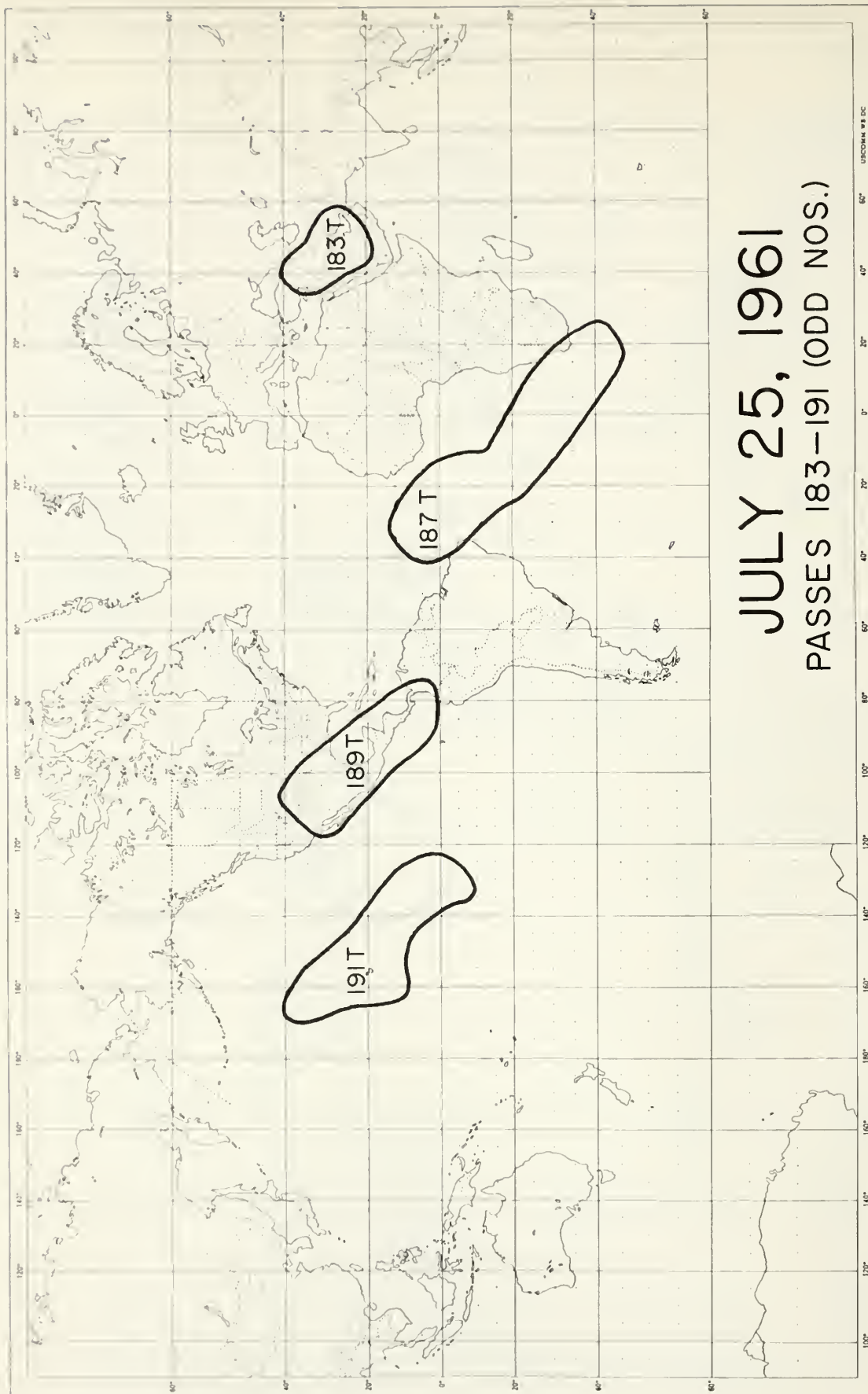






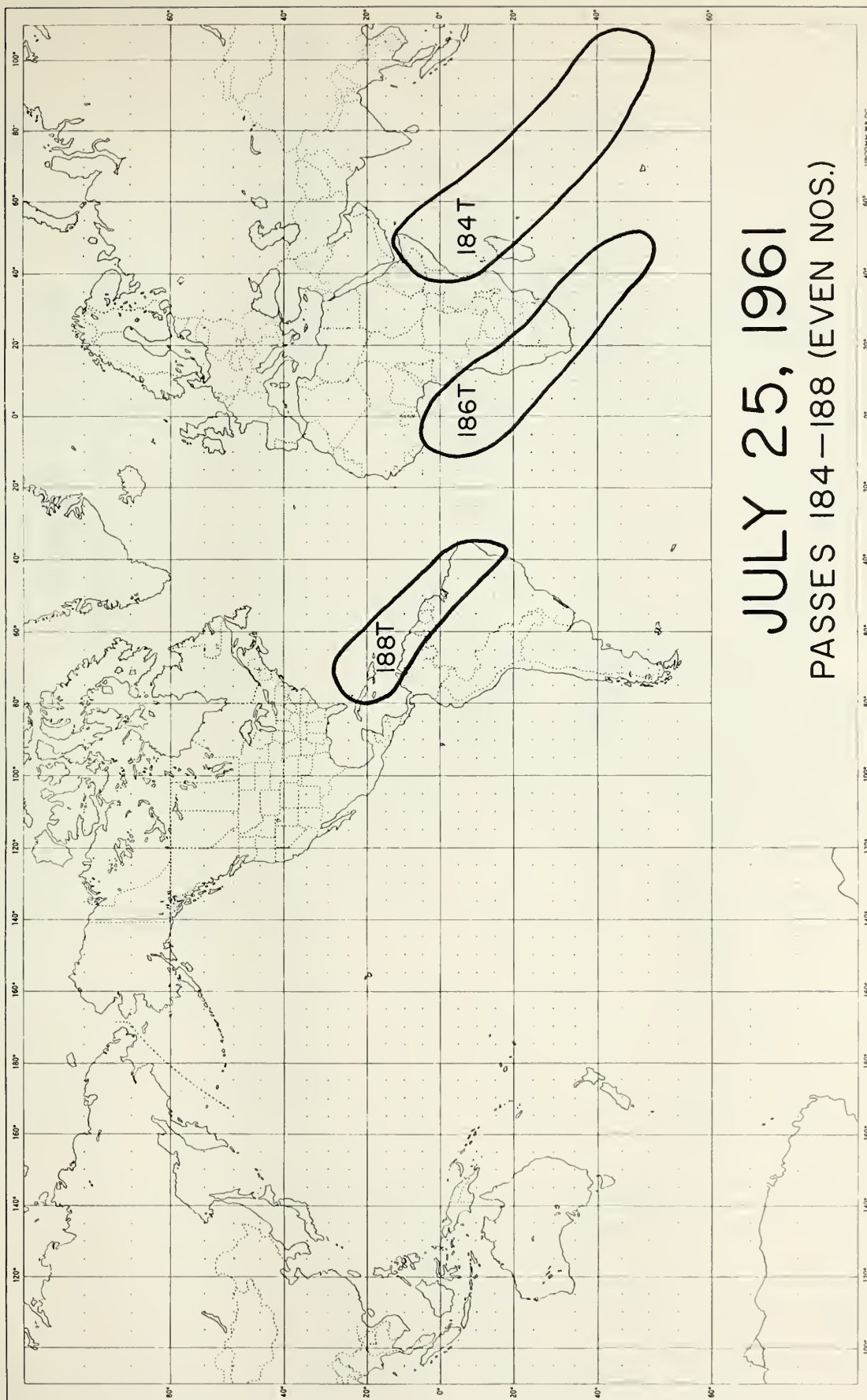




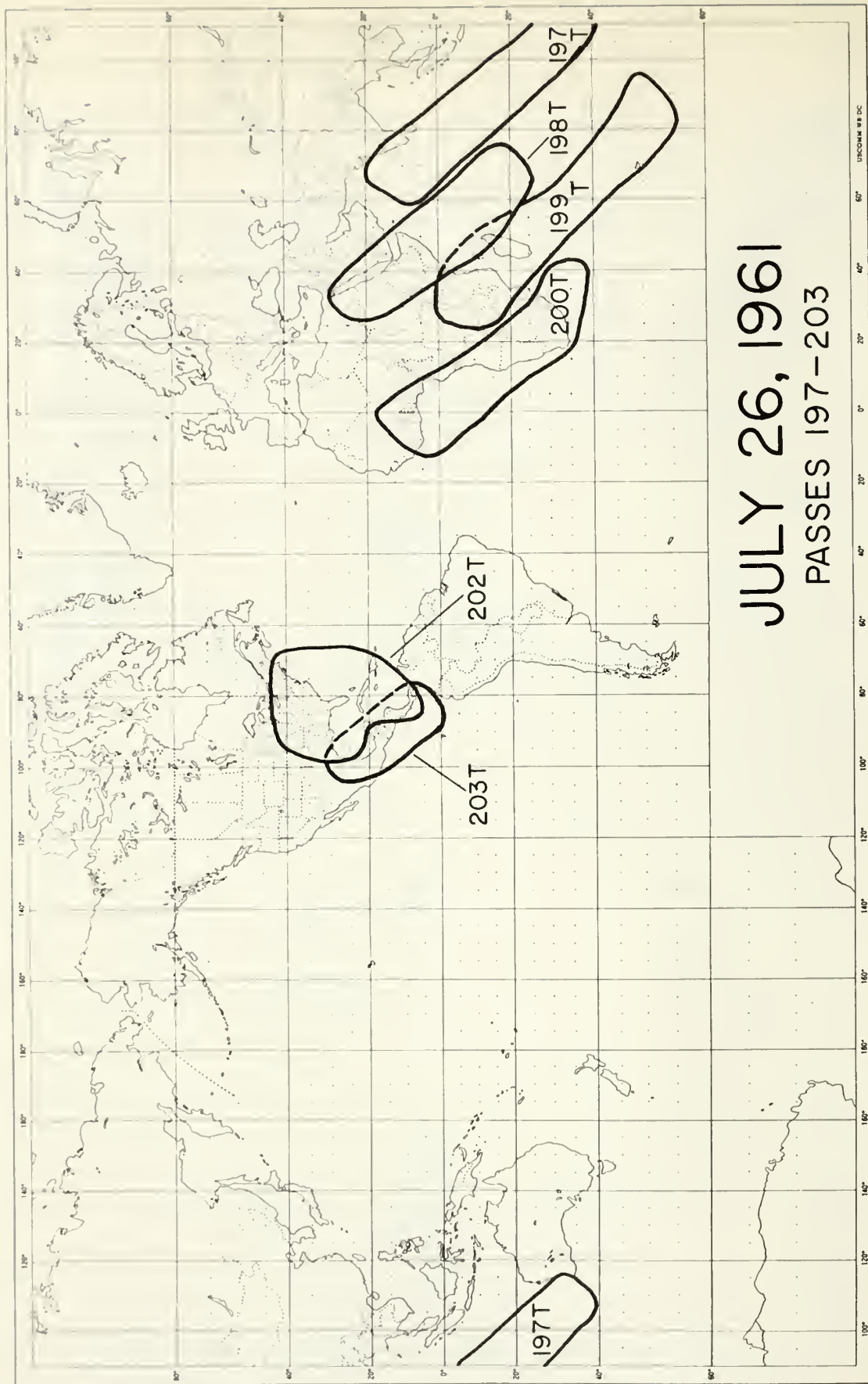


JULY 25, 1961  
PASSES 183-191 (ODD NOS.)

USCIB 48 DC

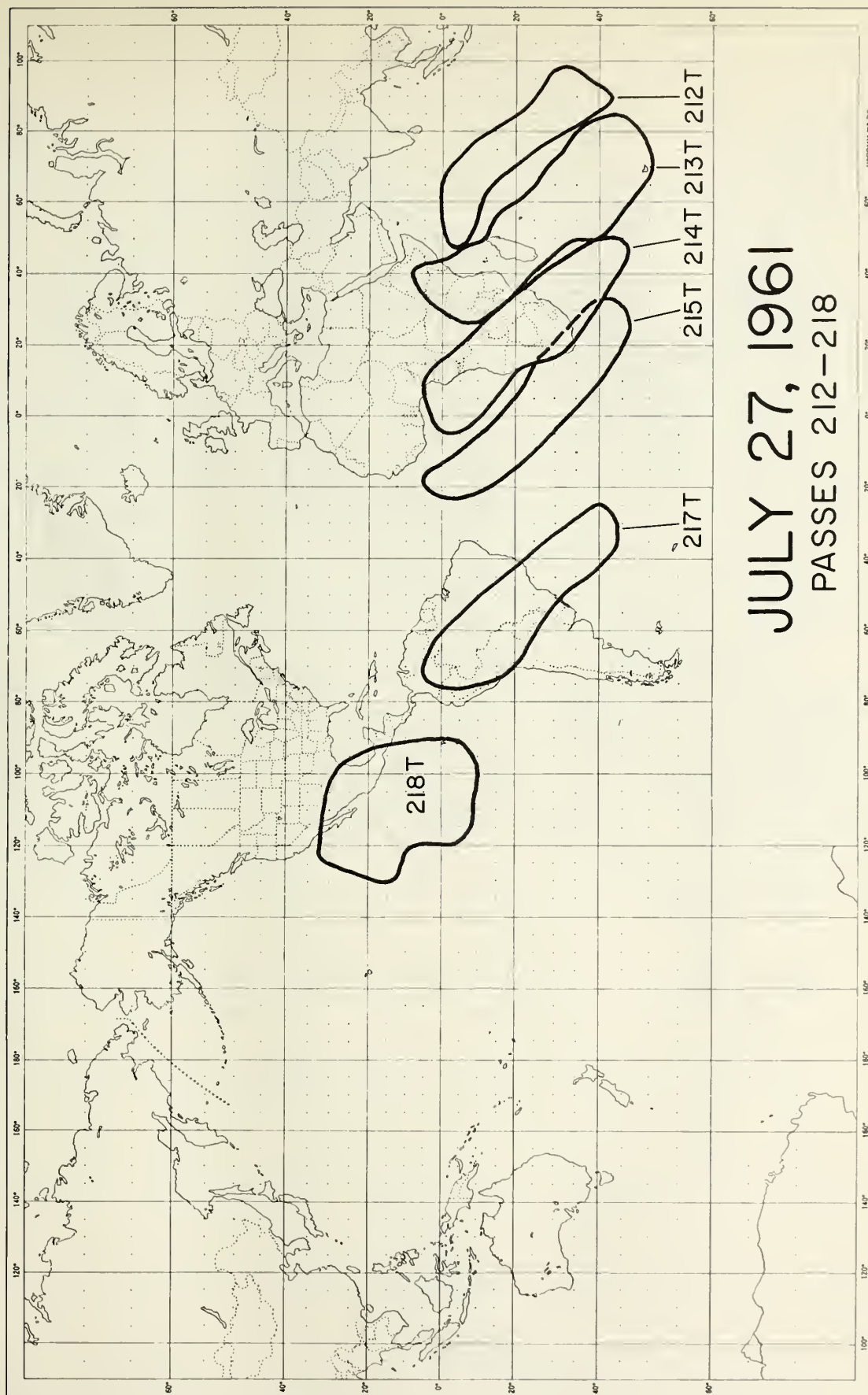


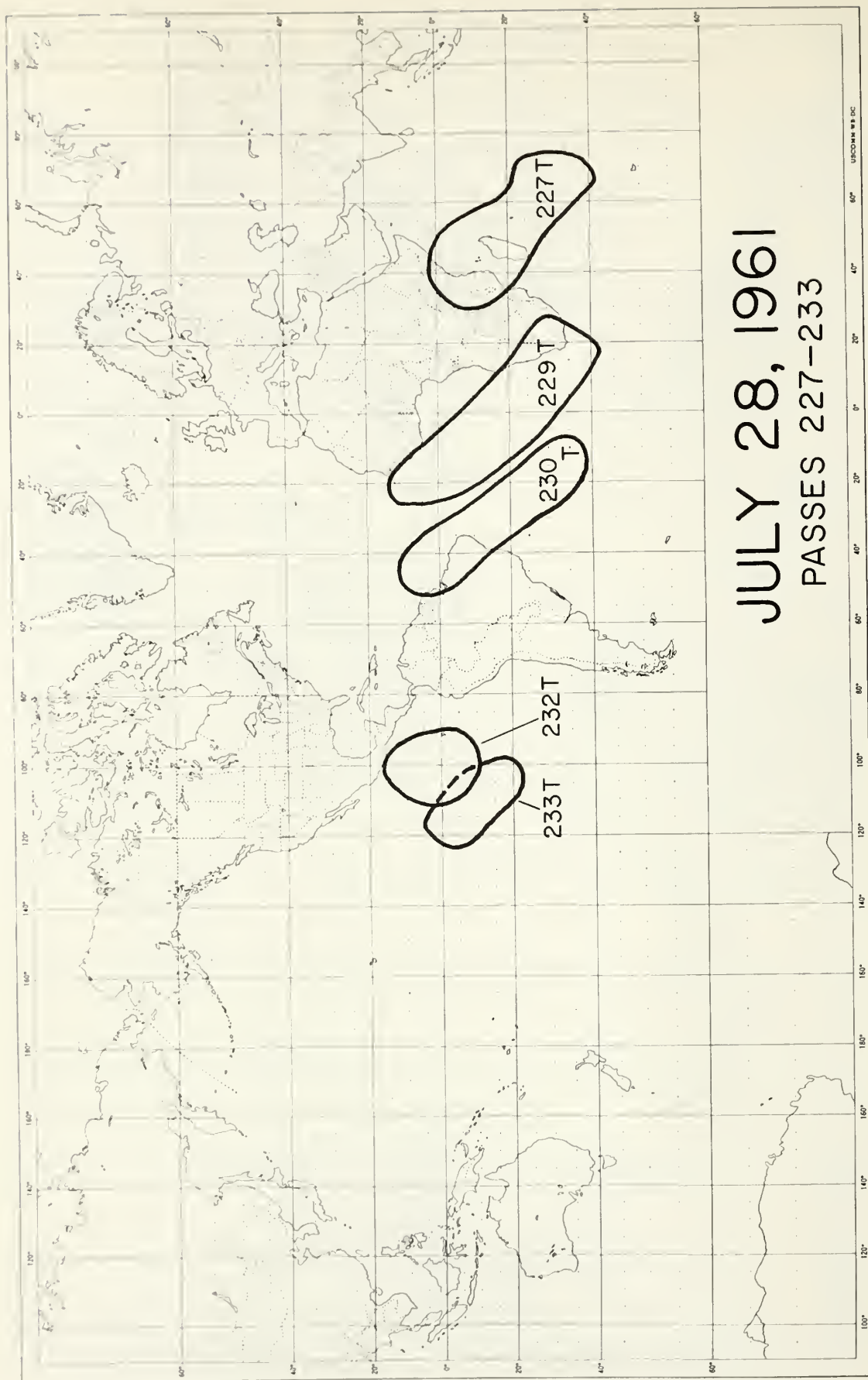




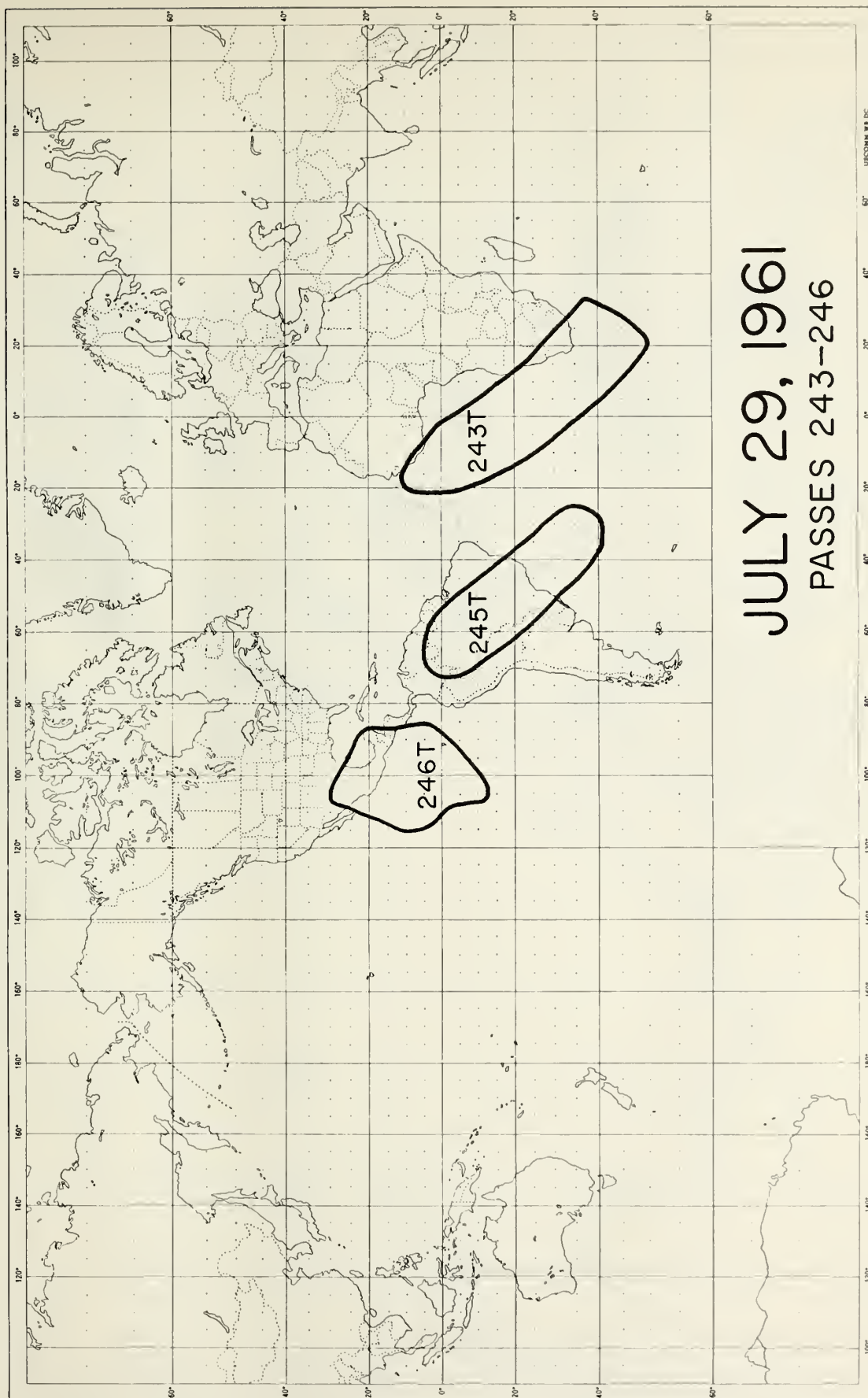
# JULY 26, 1961

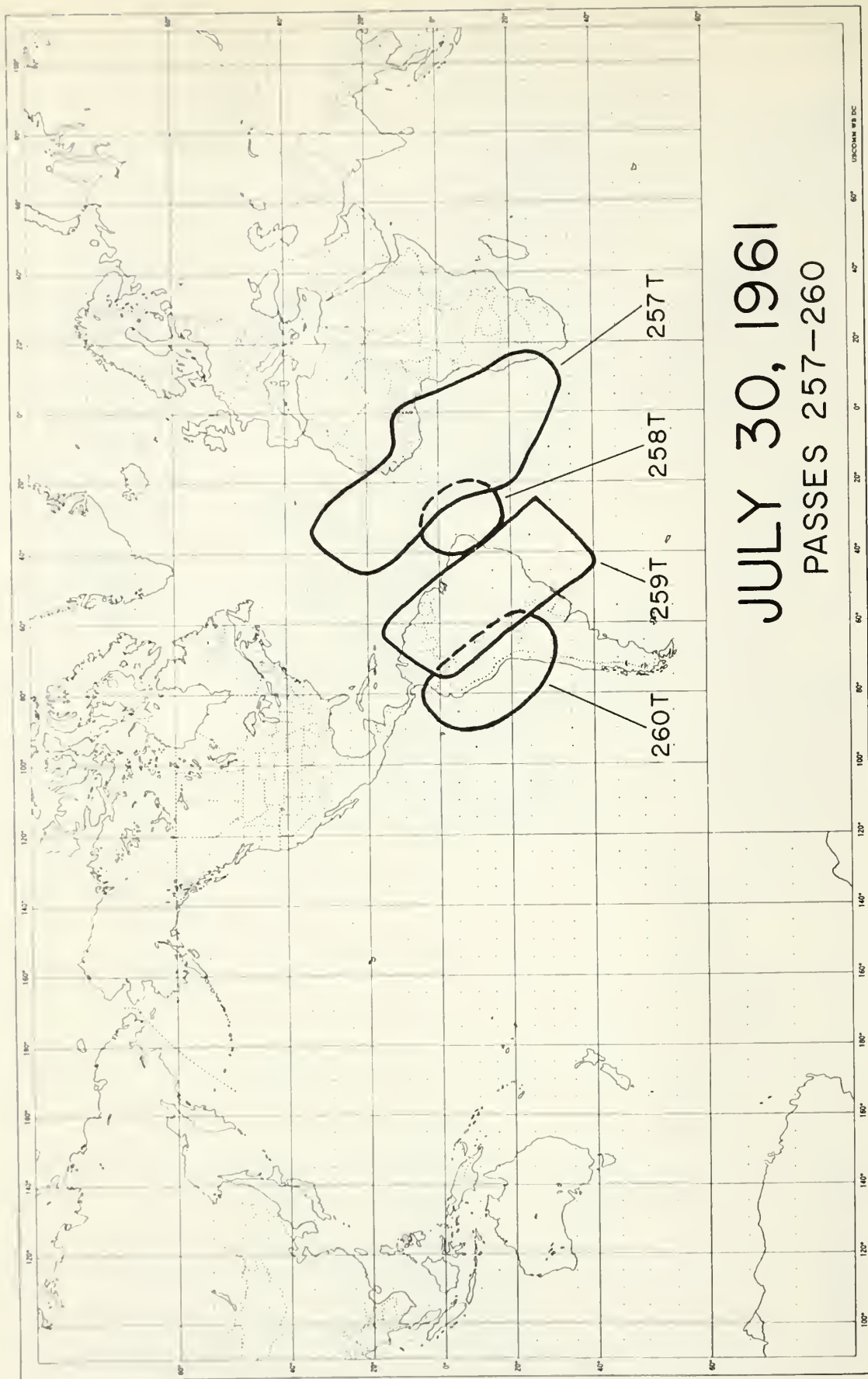
## PASSES 197-203

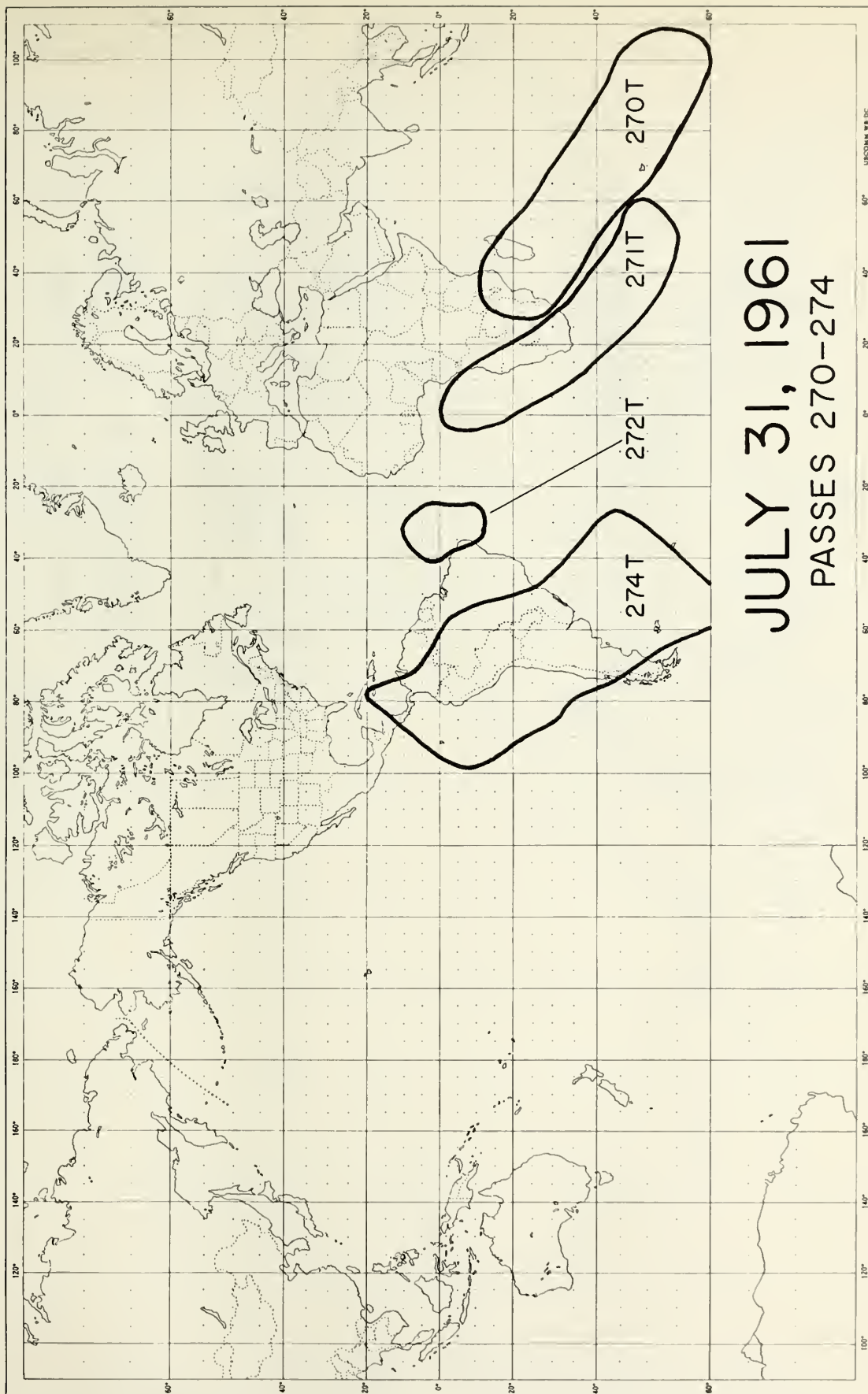






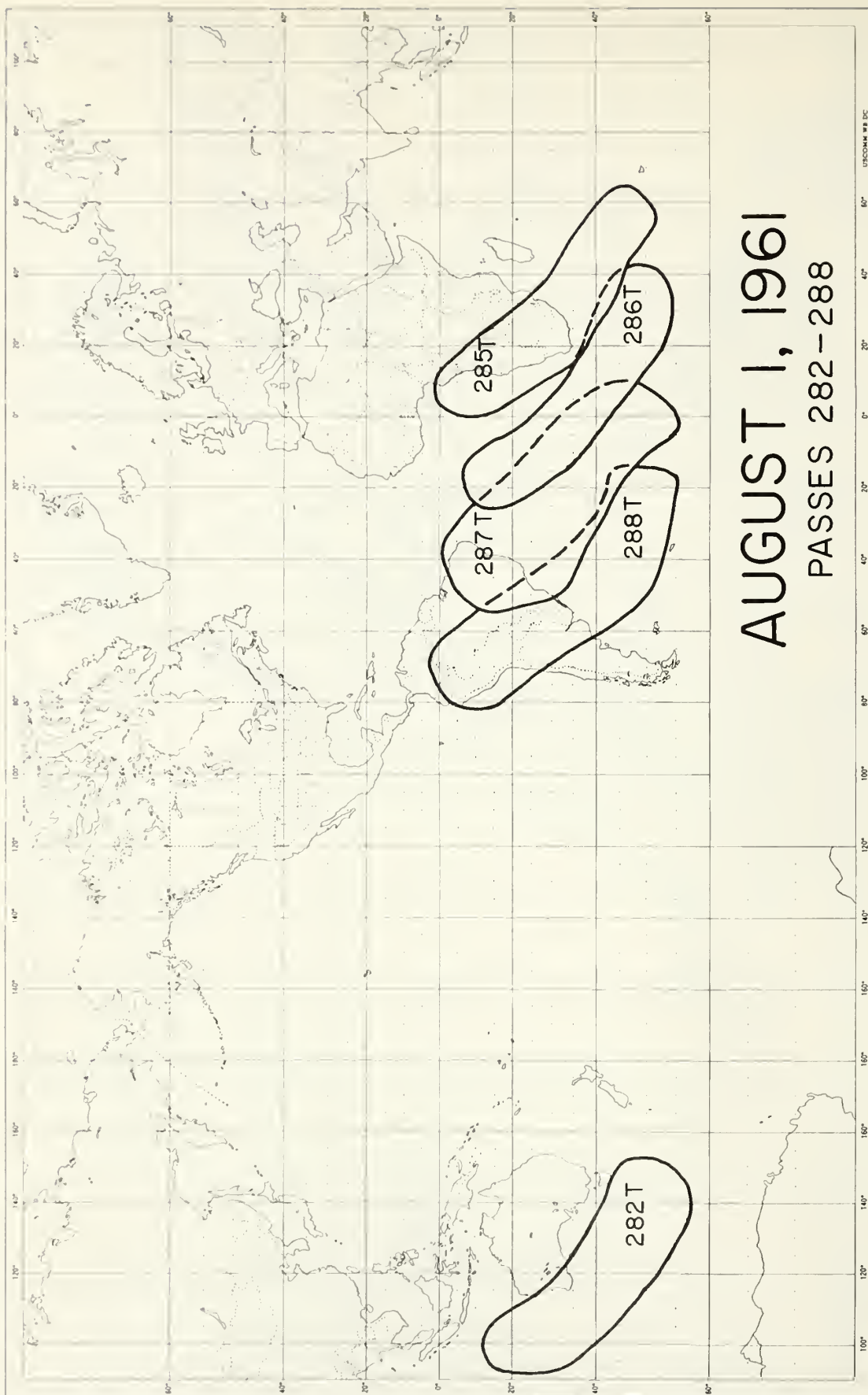




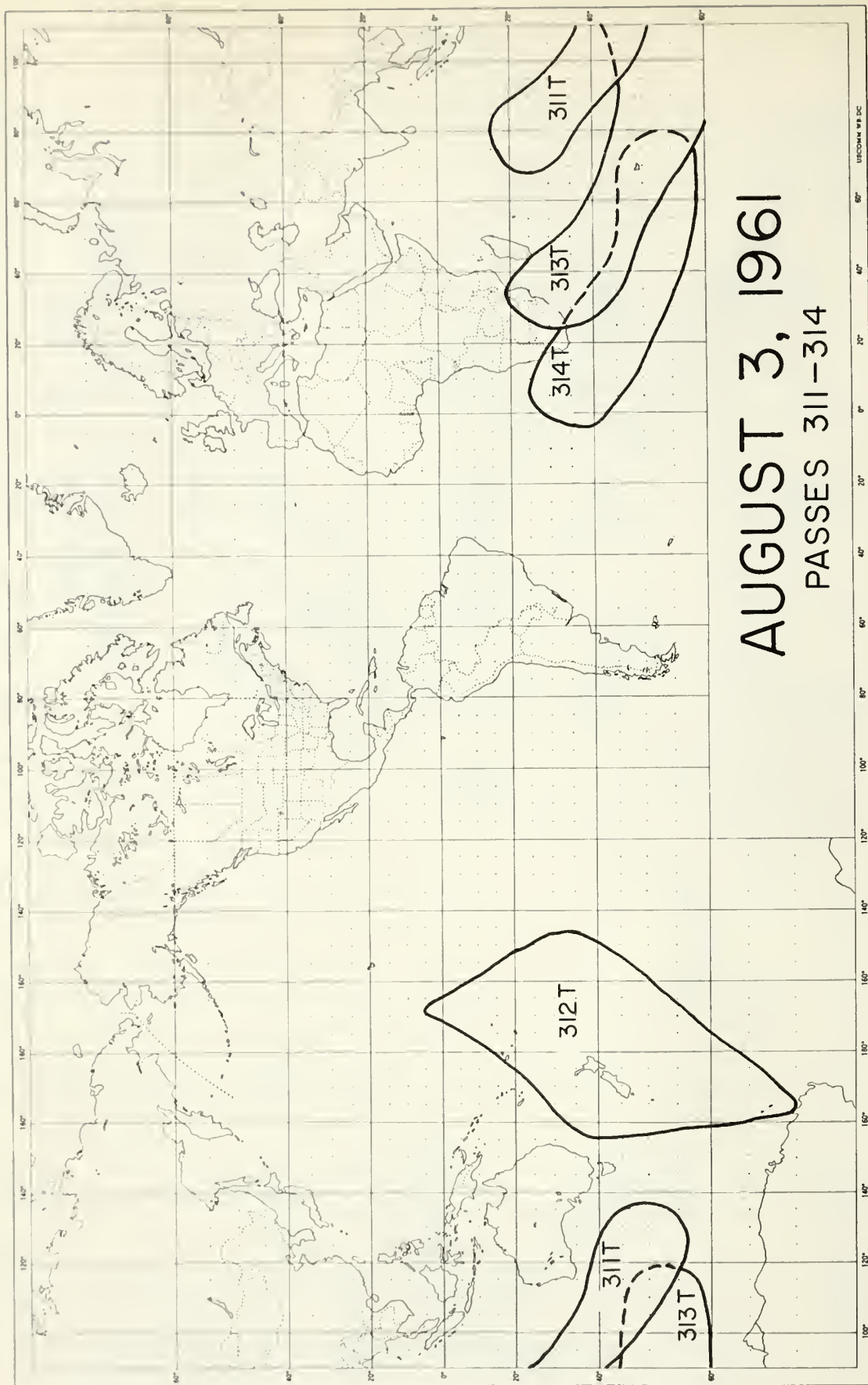


JULY 31, 1961  
PASSES 270-274

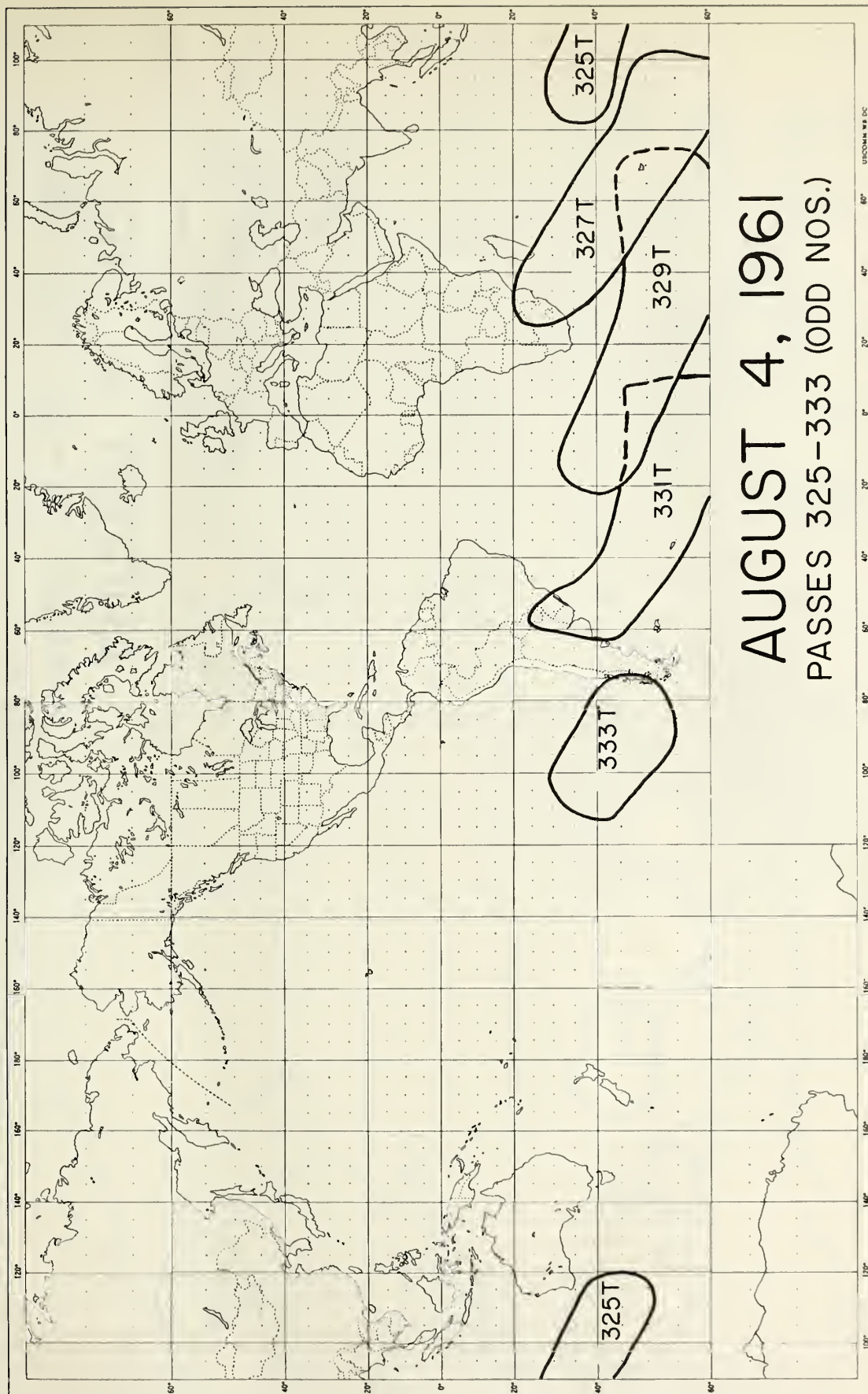


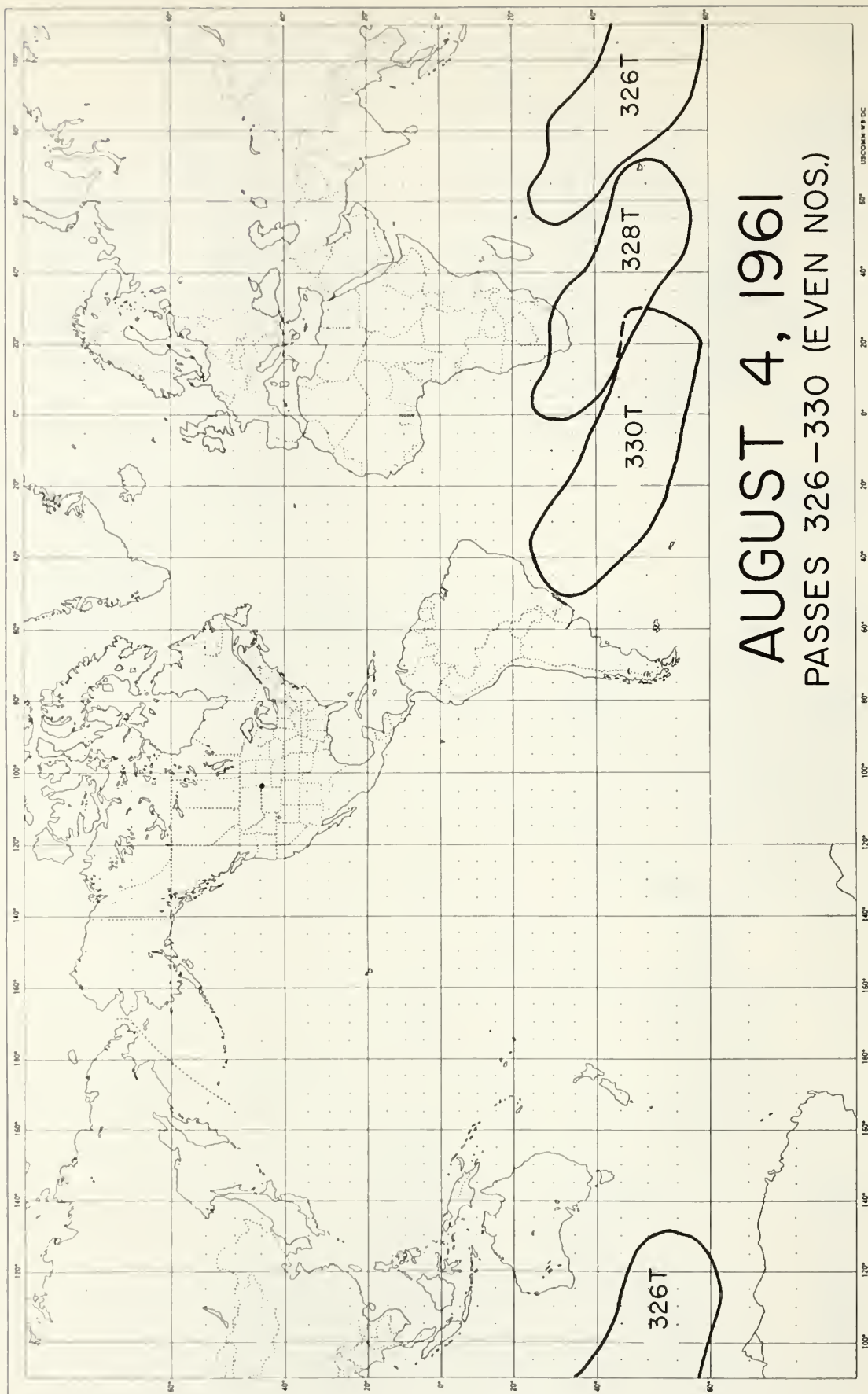


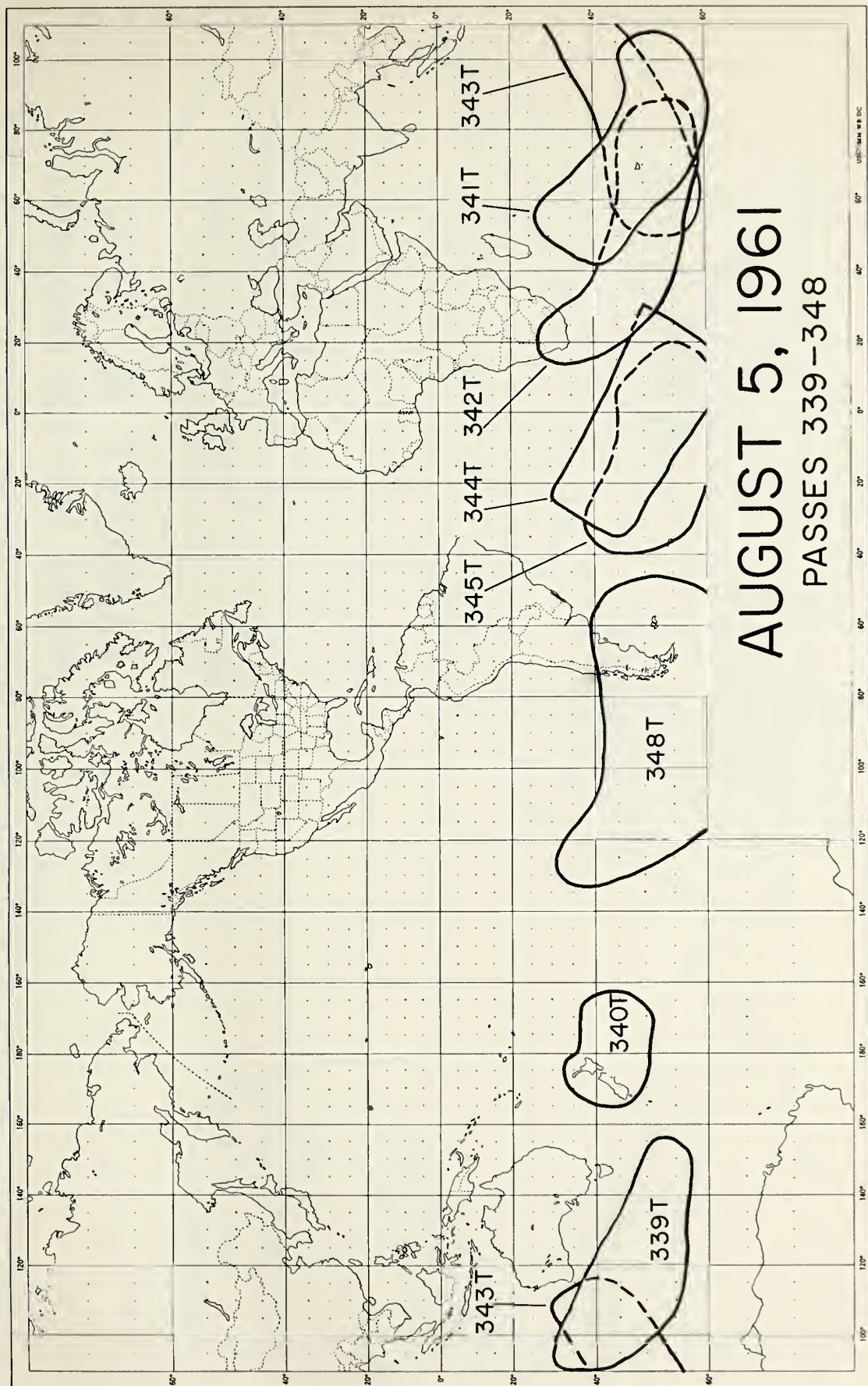






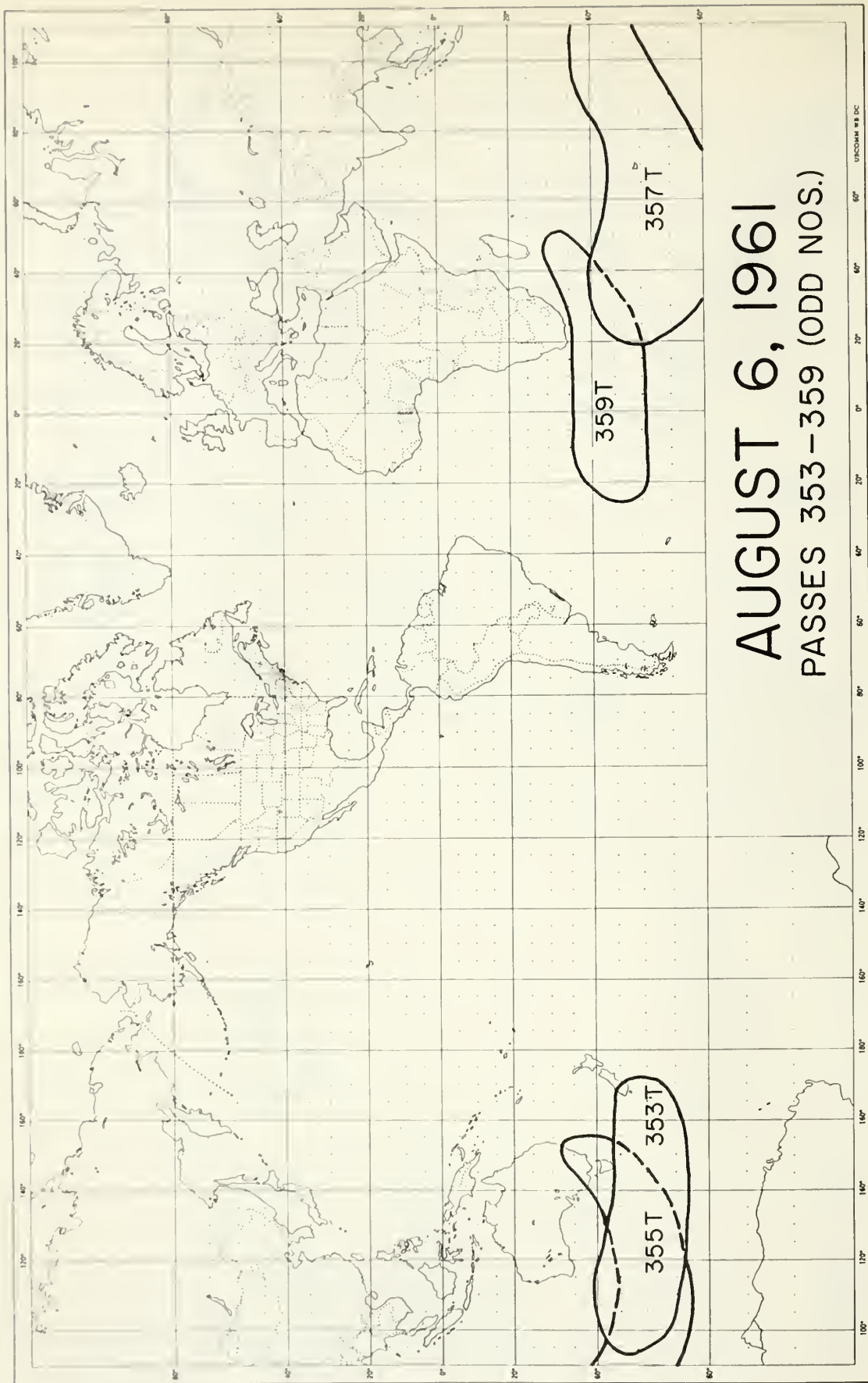


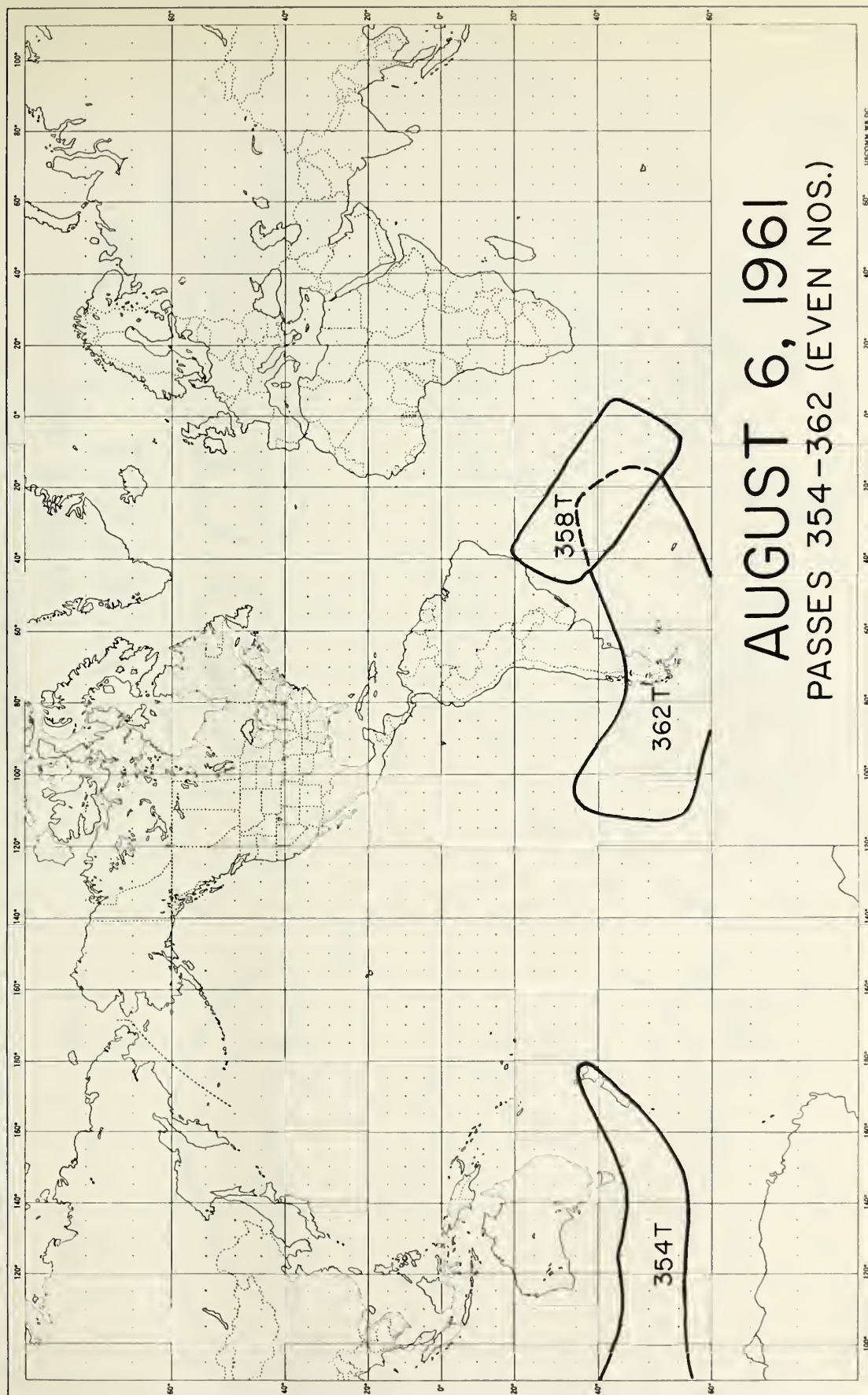


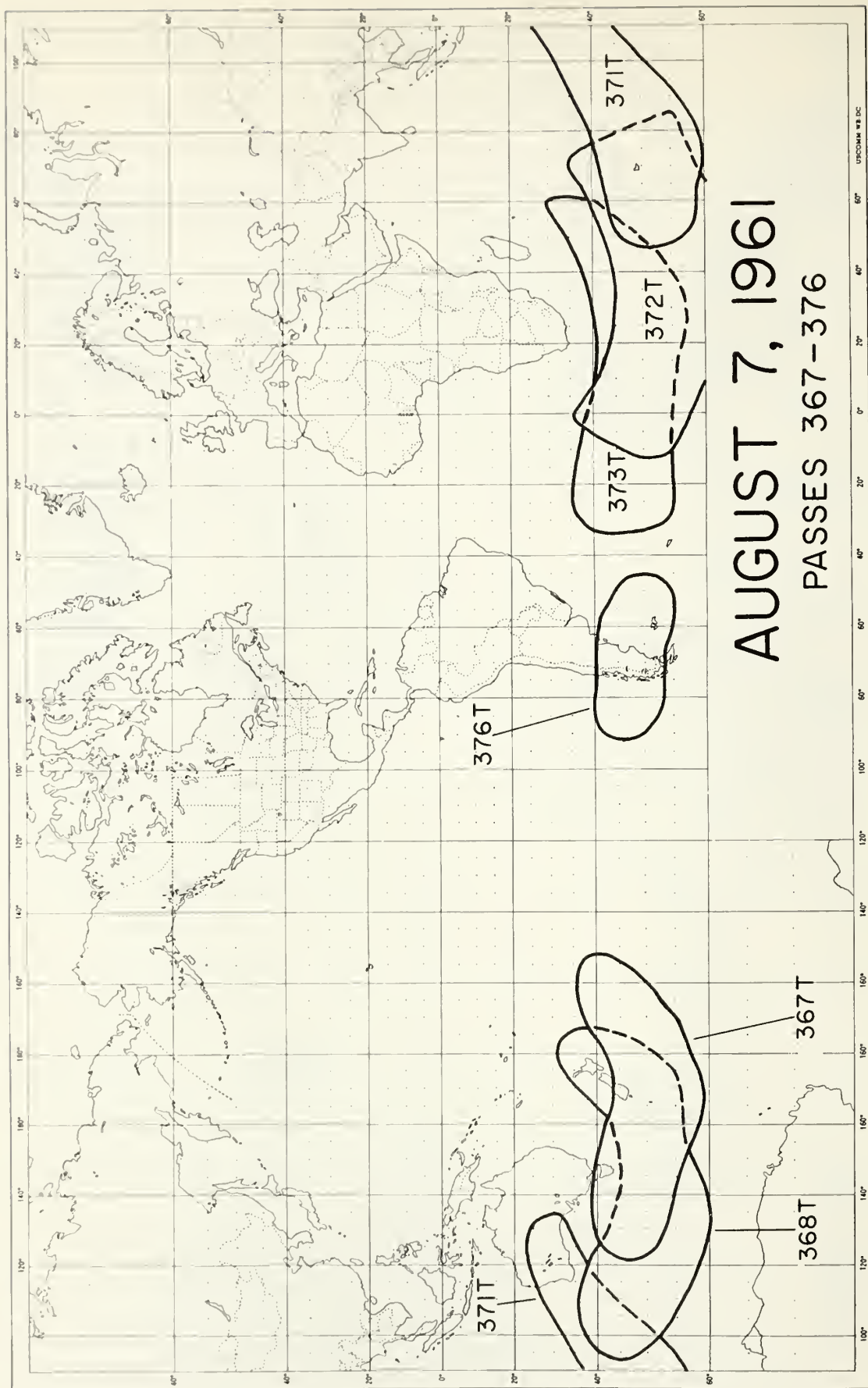


AUGUST 5, 1961  
PASSES 339-348

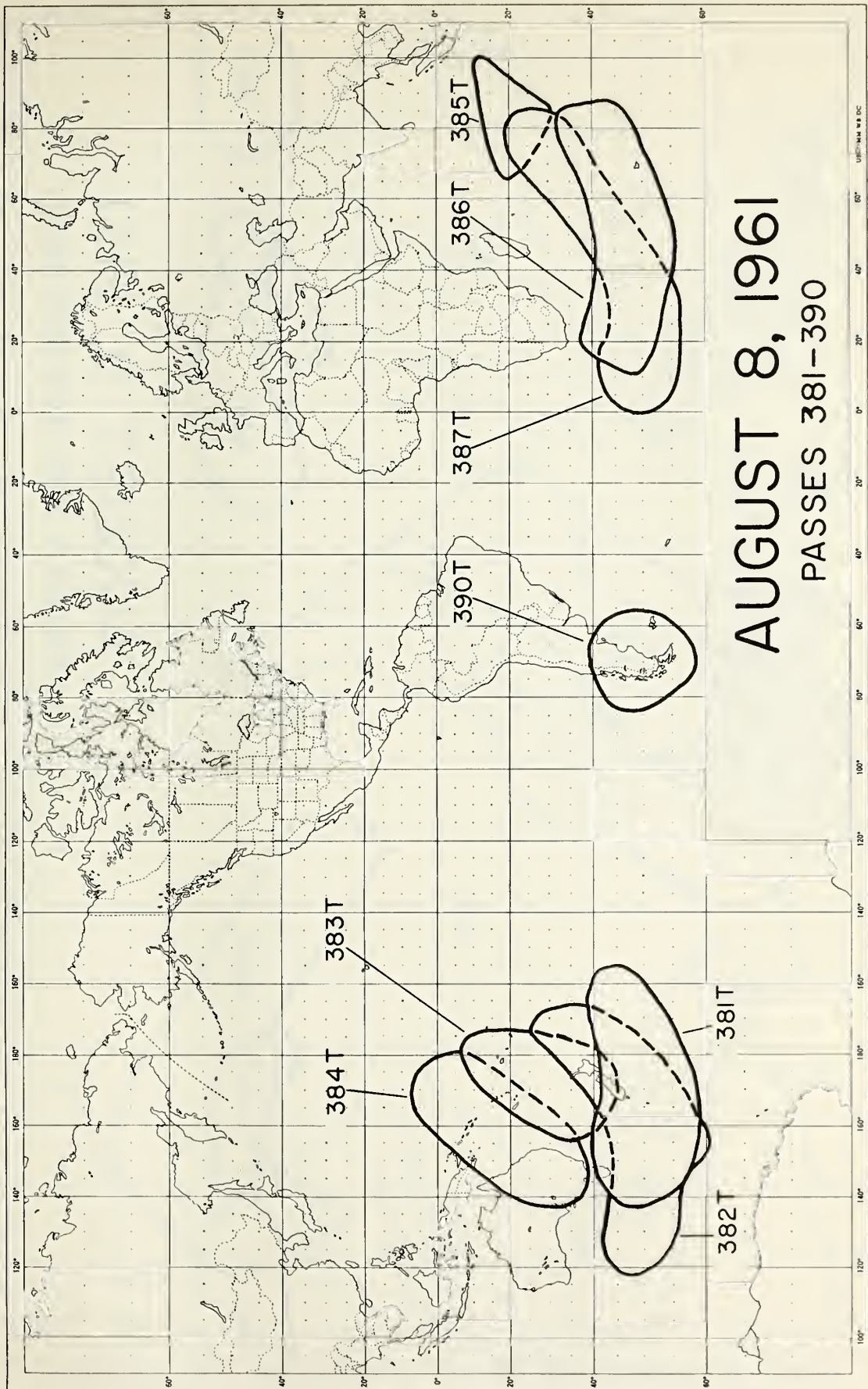






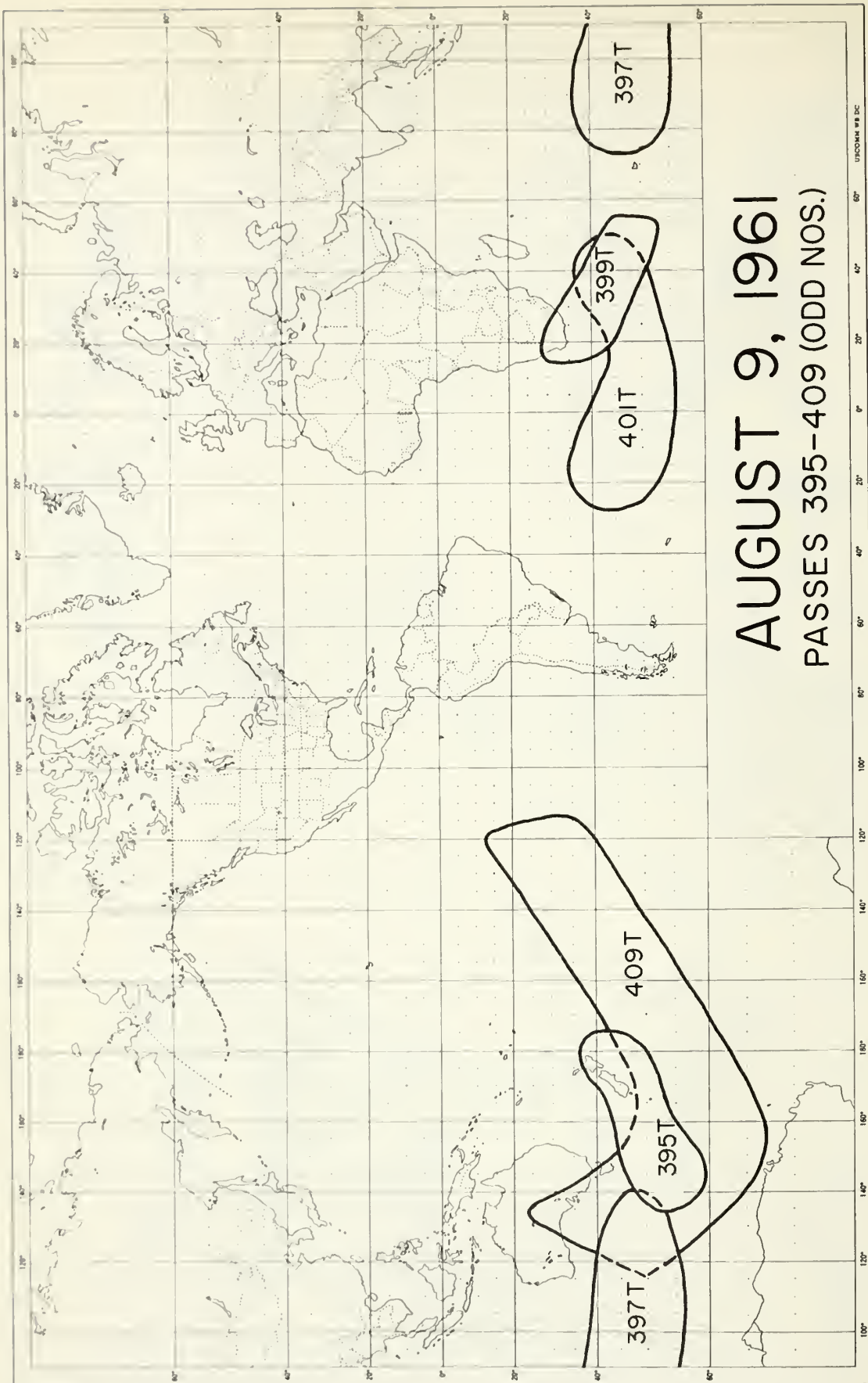






# AUGUST 8, 1961

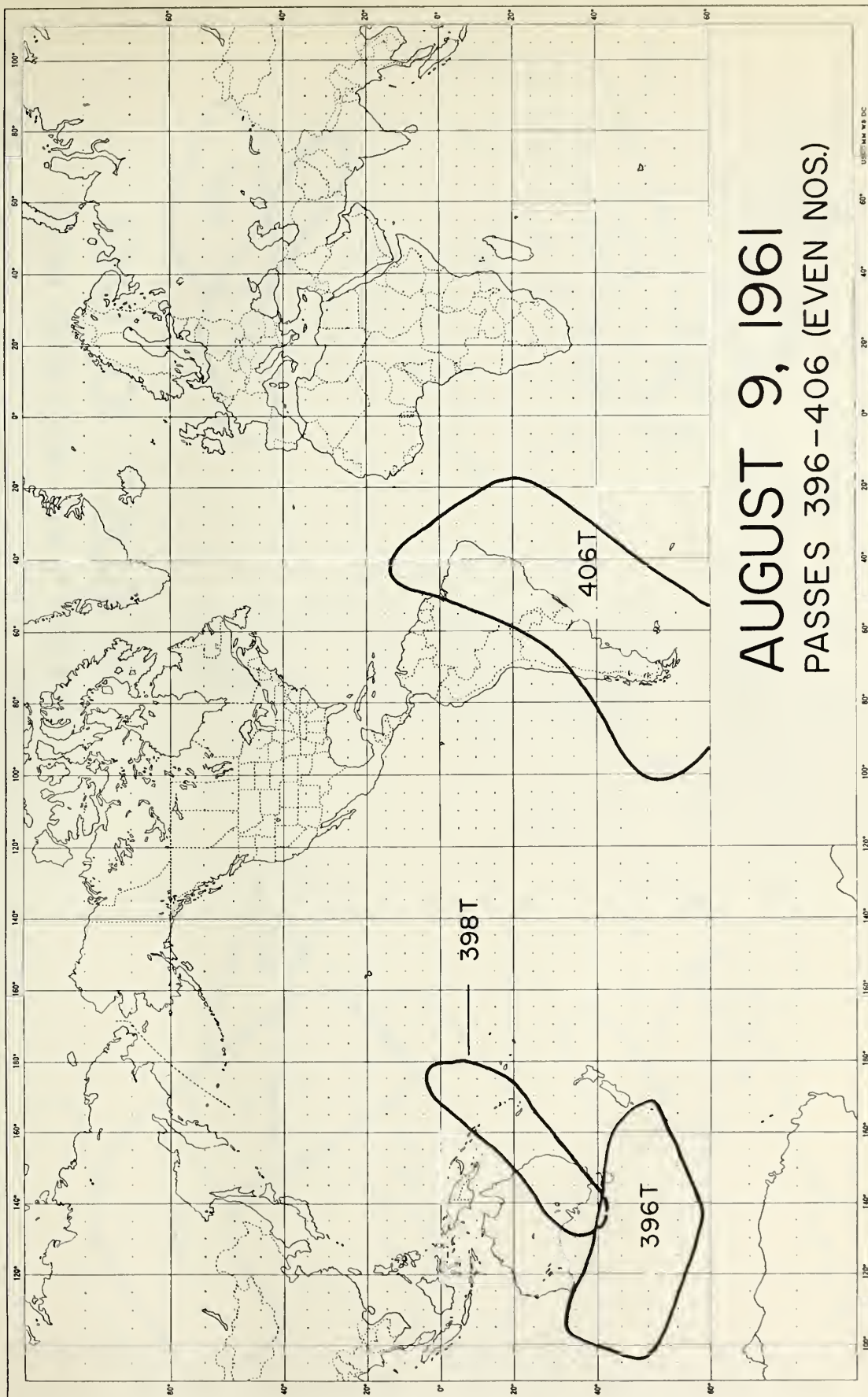
## PASSES 381-390



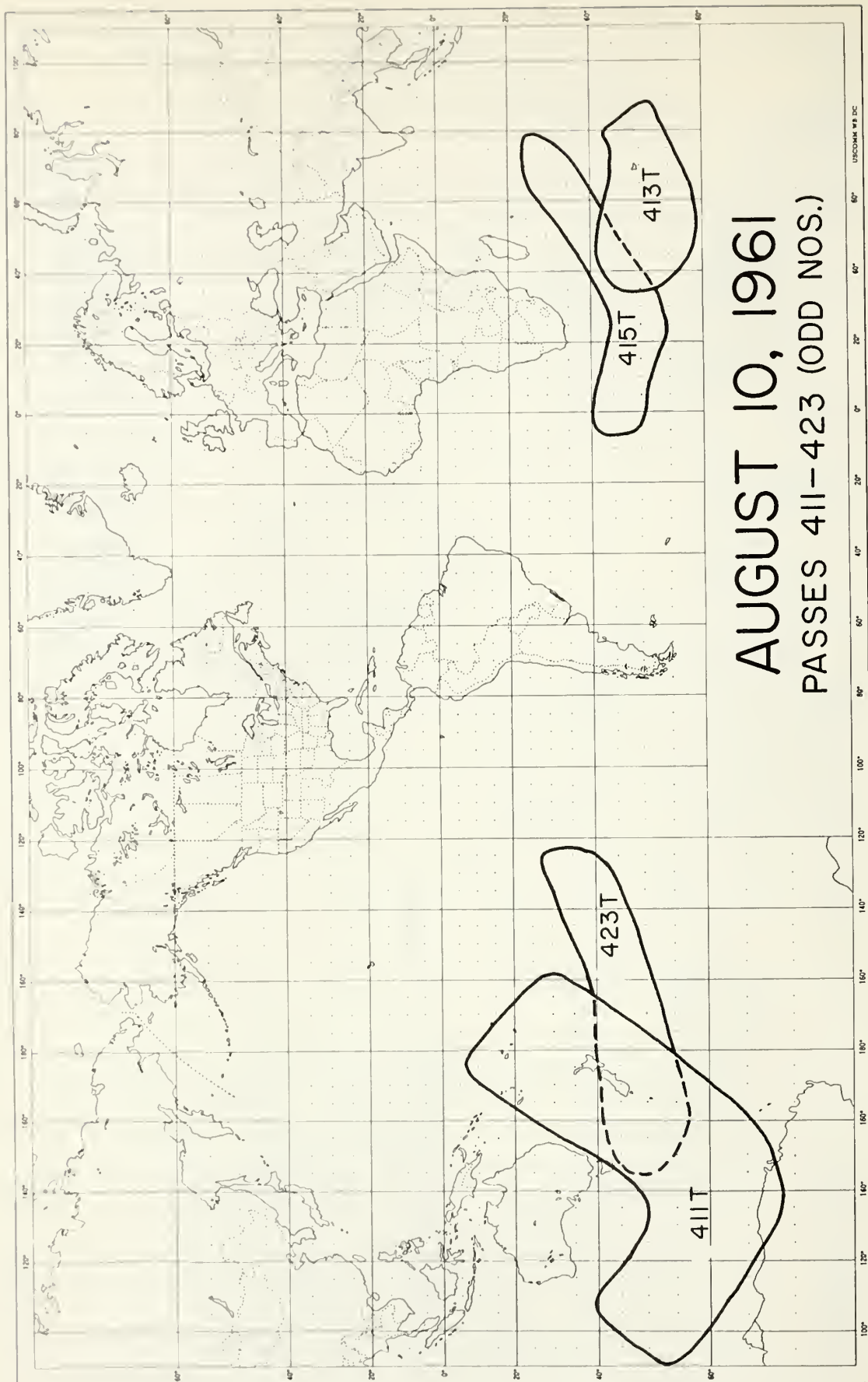
AUGUST 9, 1961  
PASSES 395-409 (ODD NOS.)

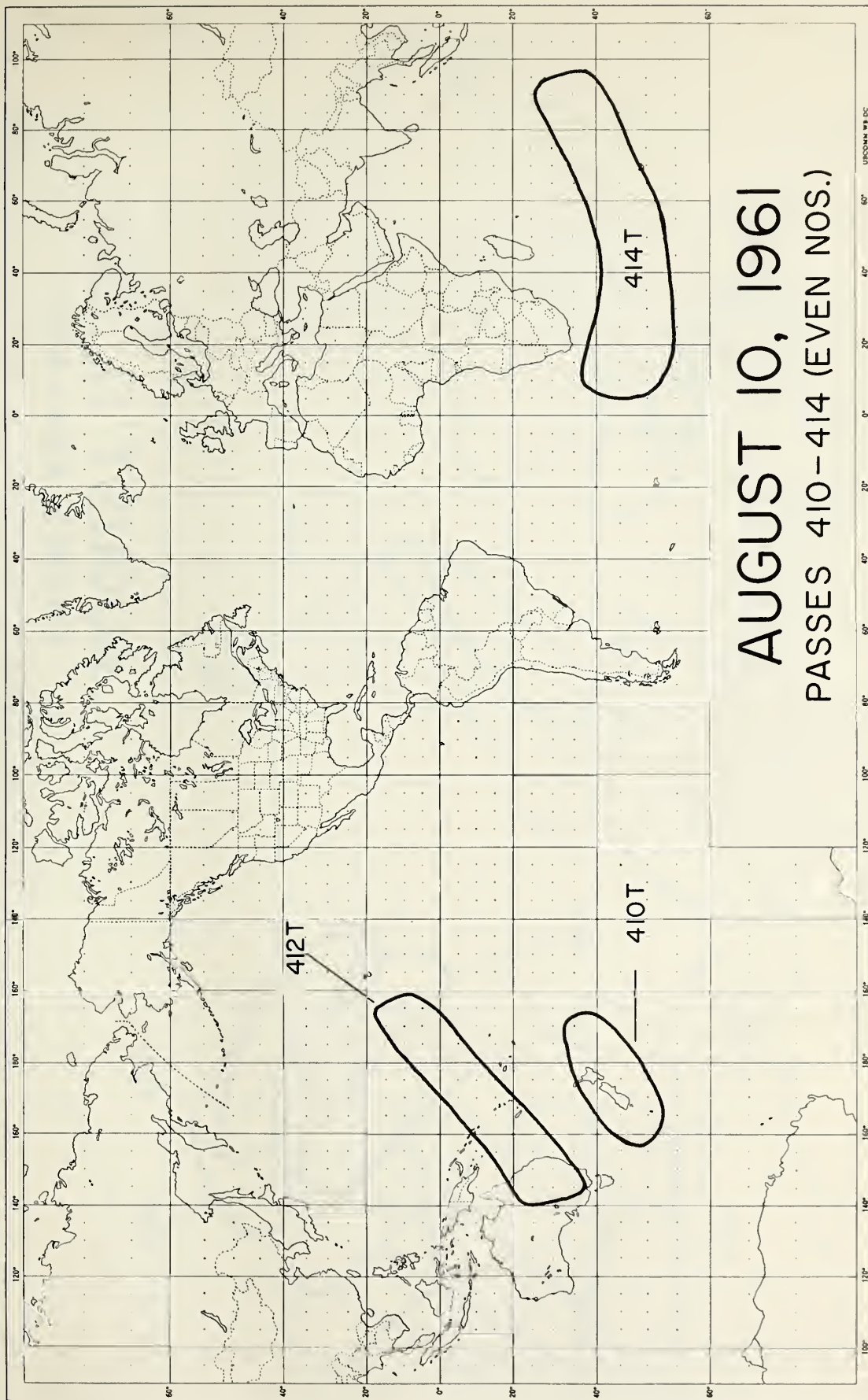
USCNAV # 3C

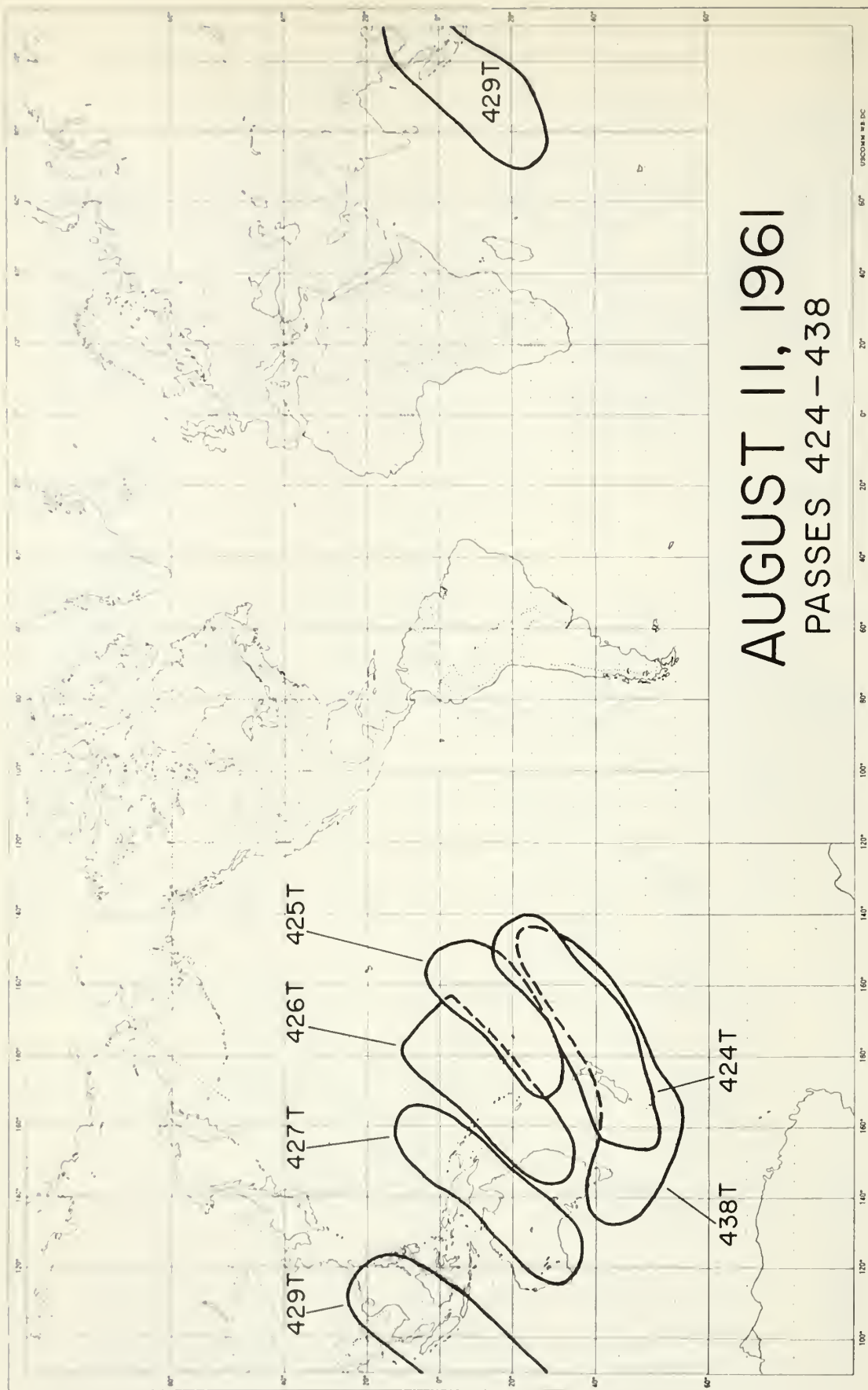




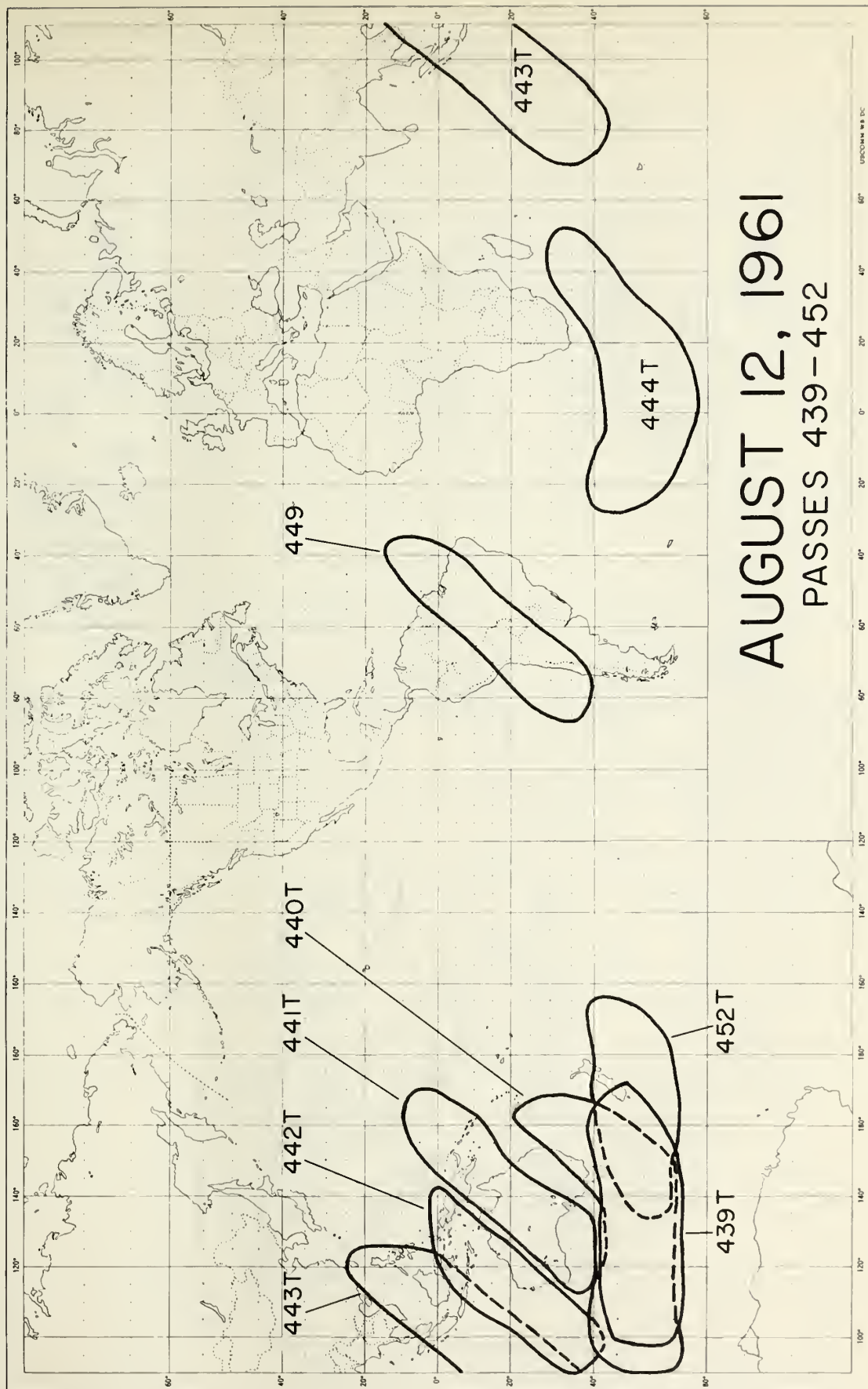


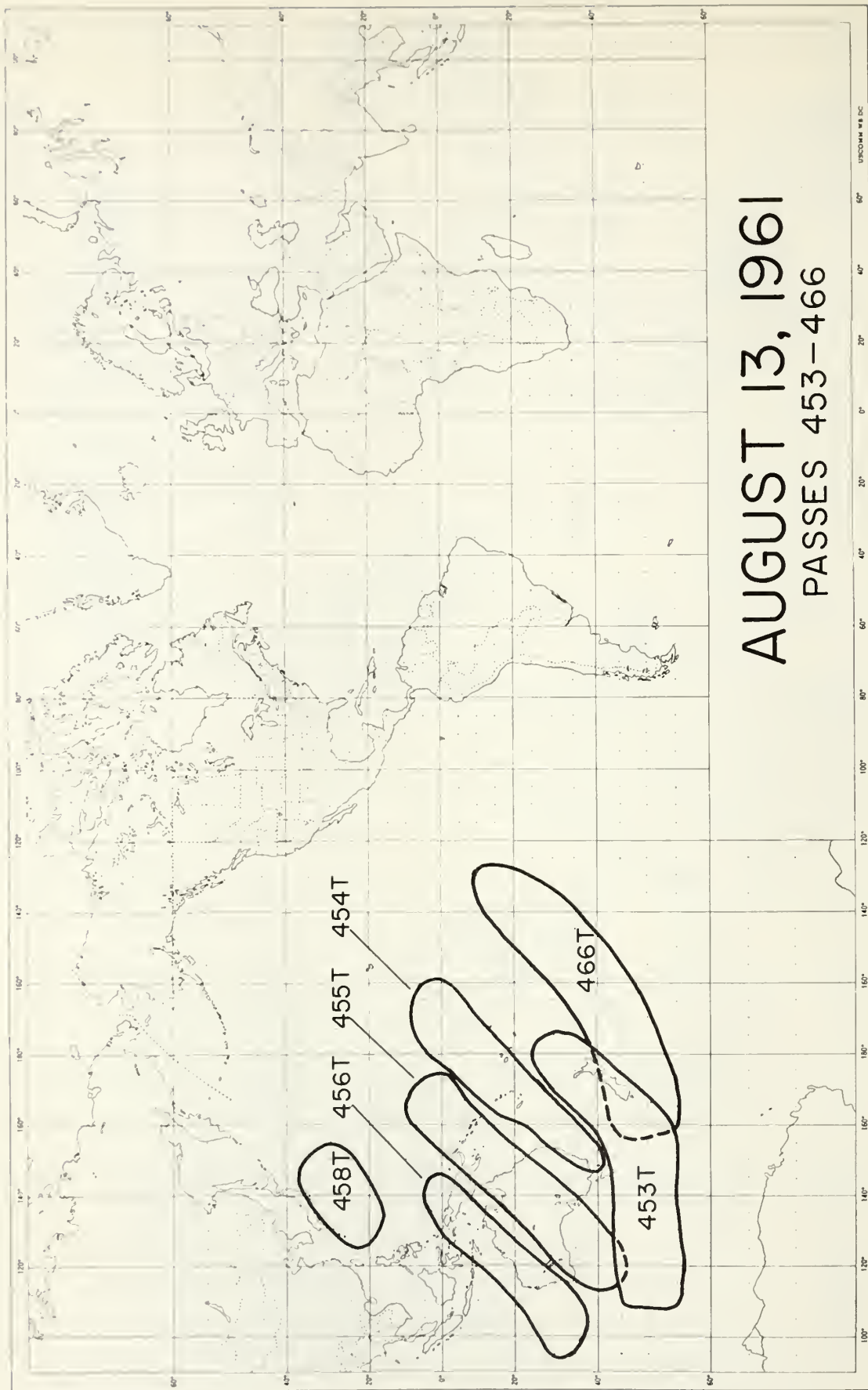


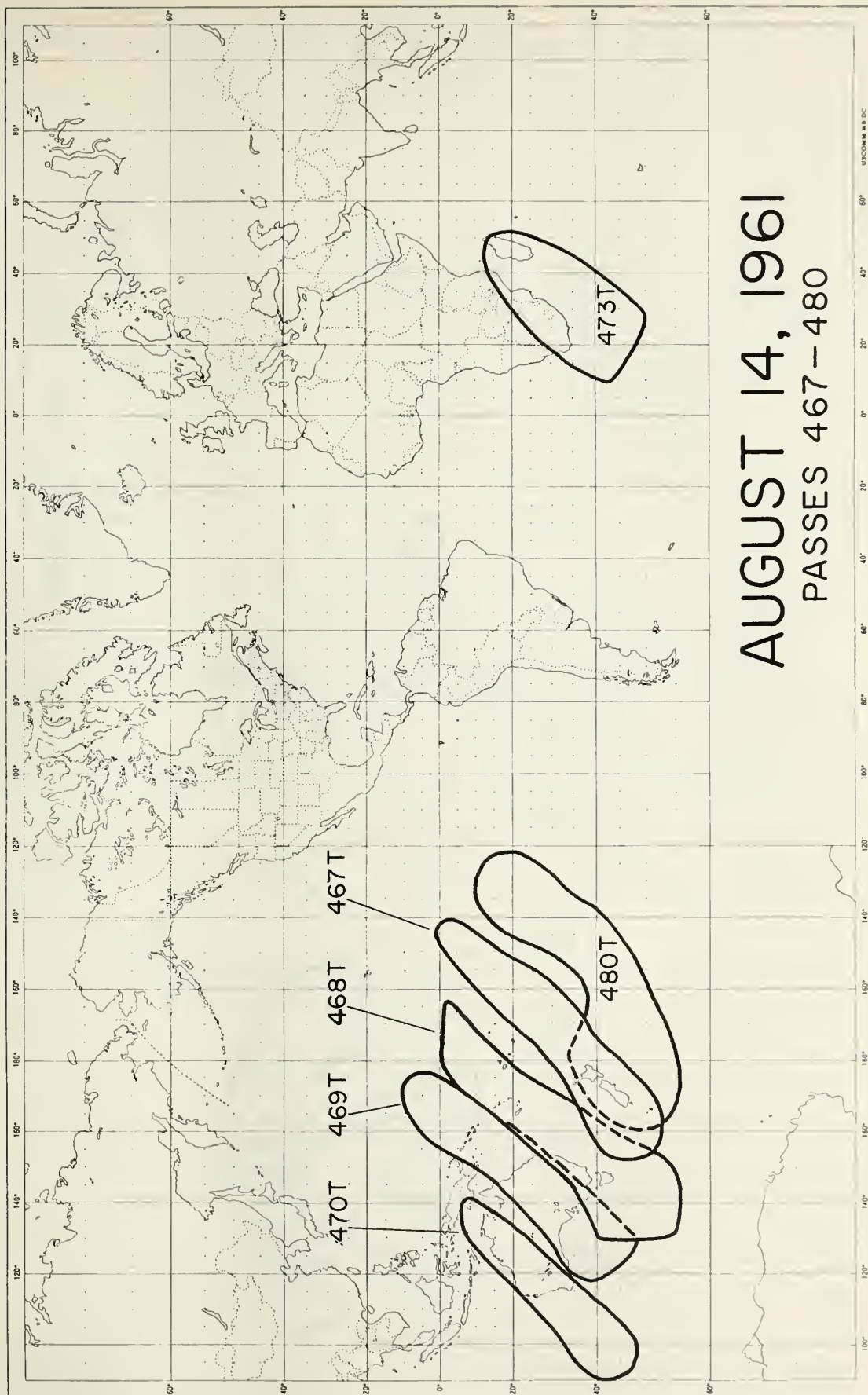






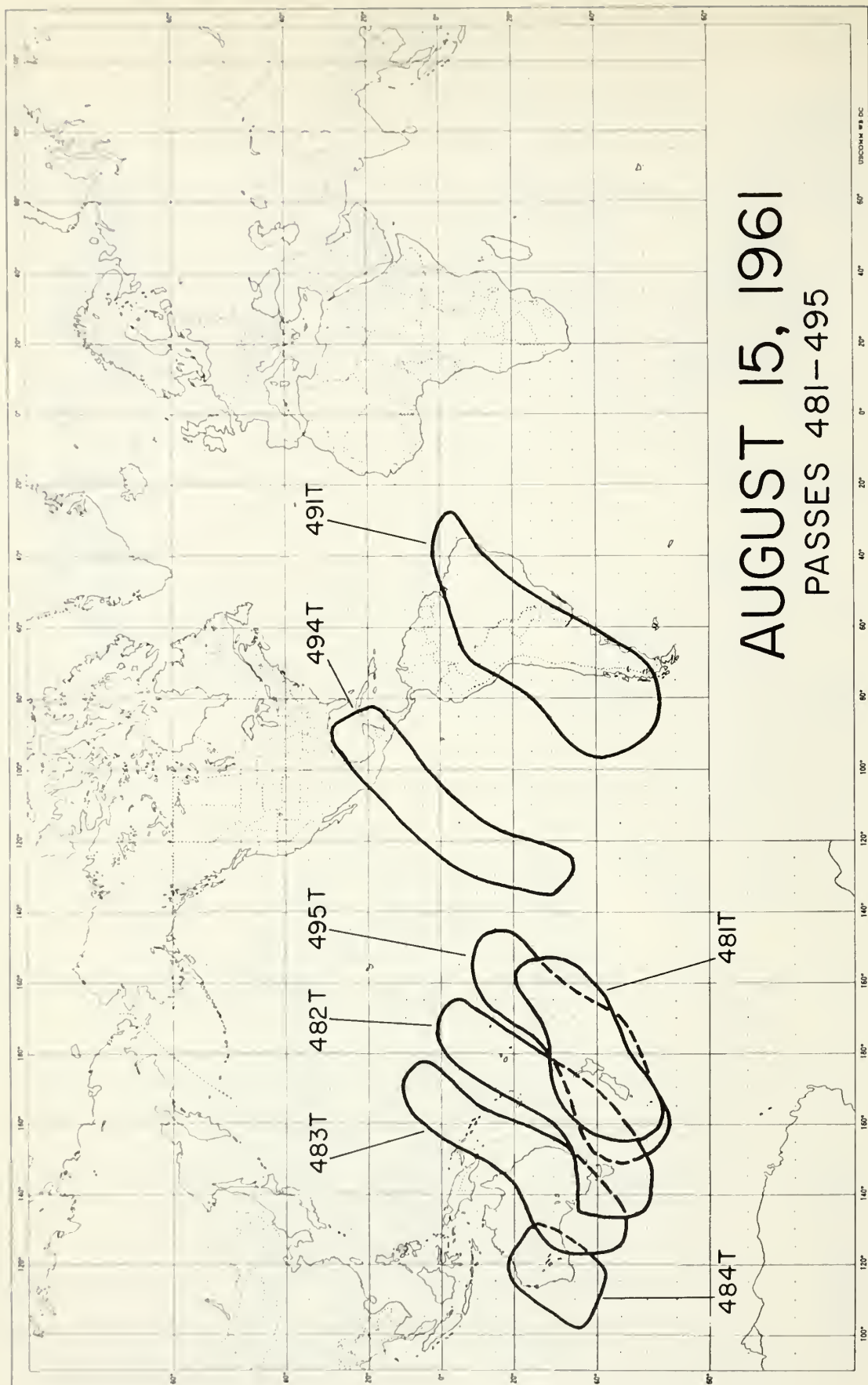


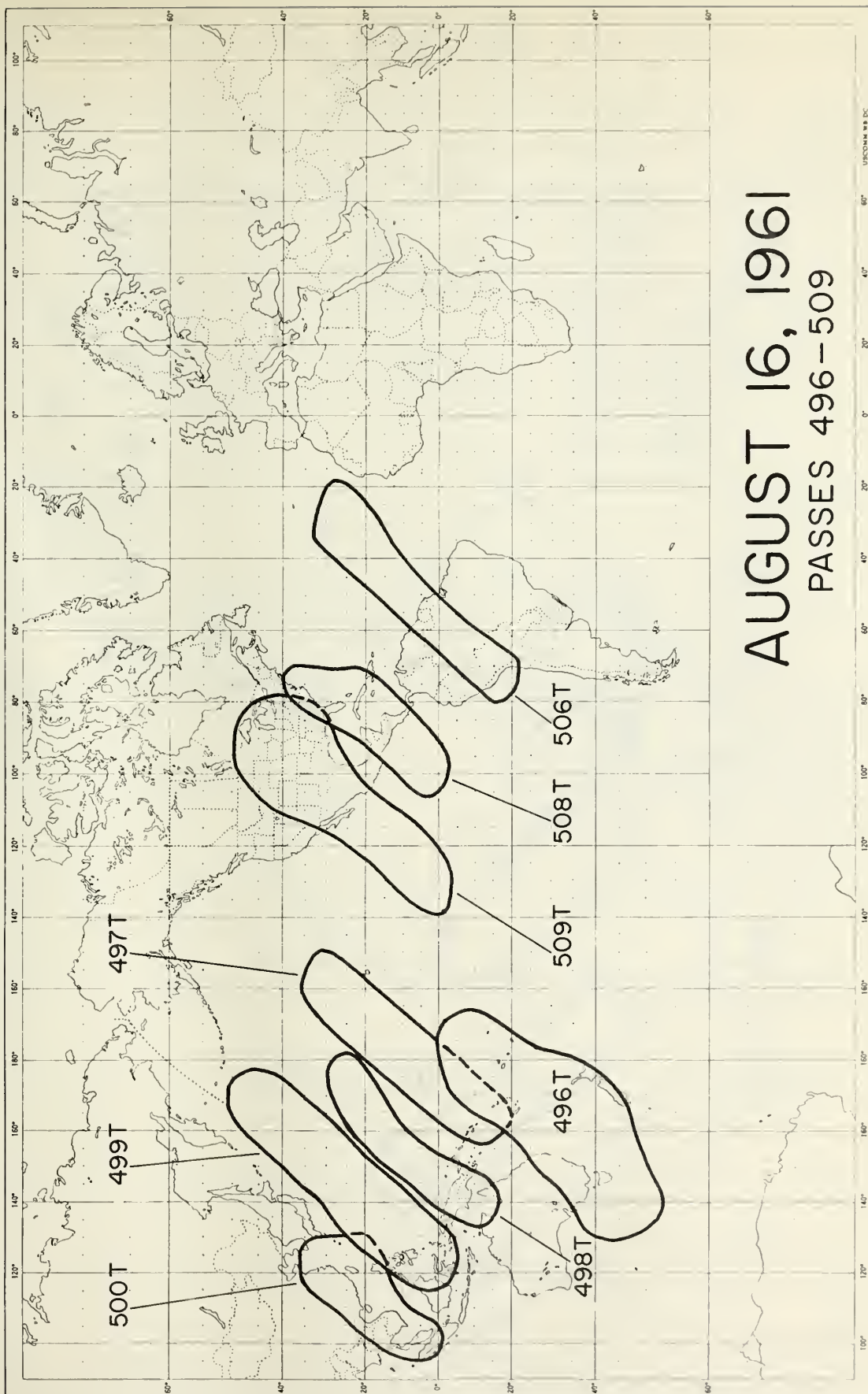




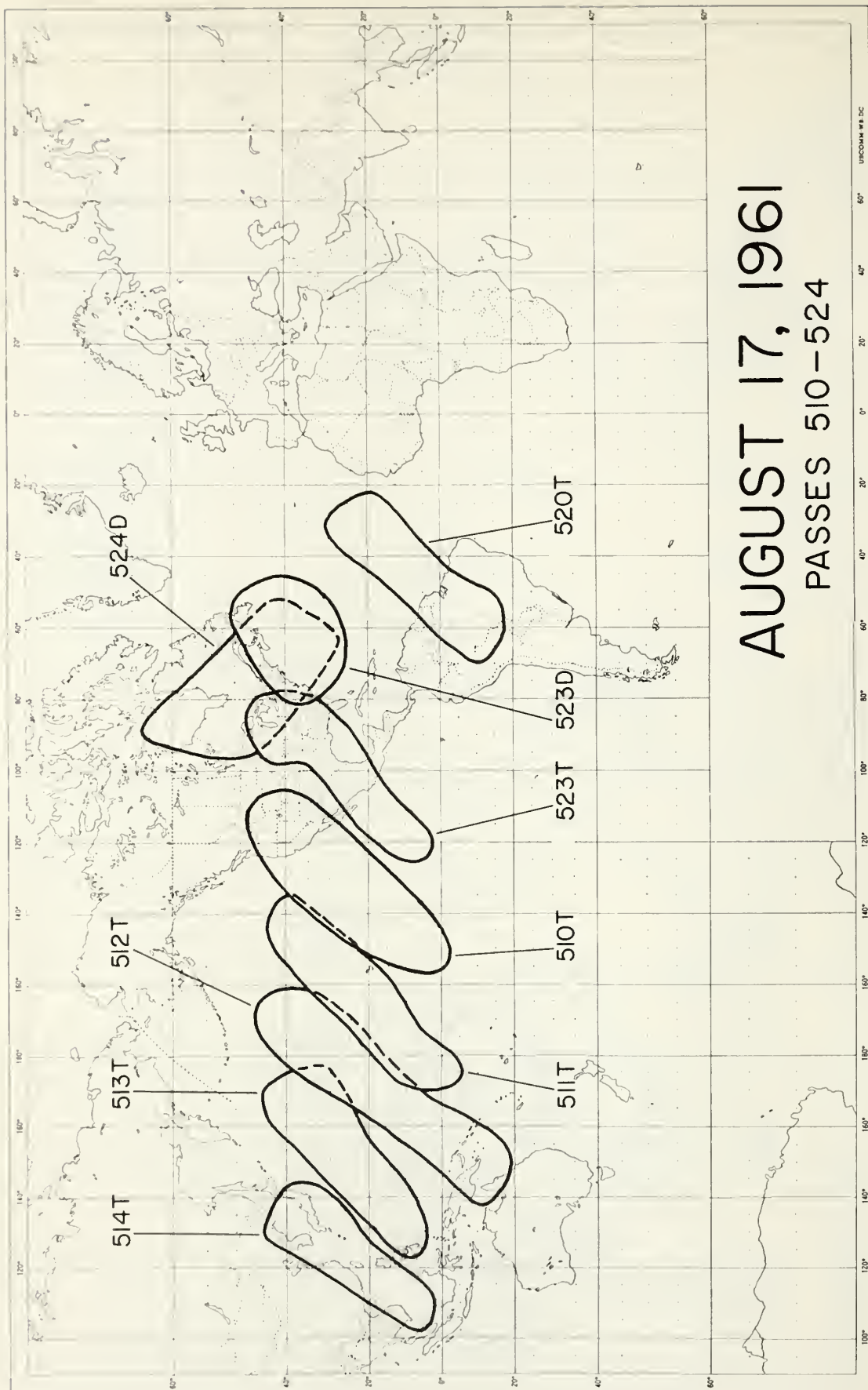
AUGUST 14, 1961  
PASSES 467-480



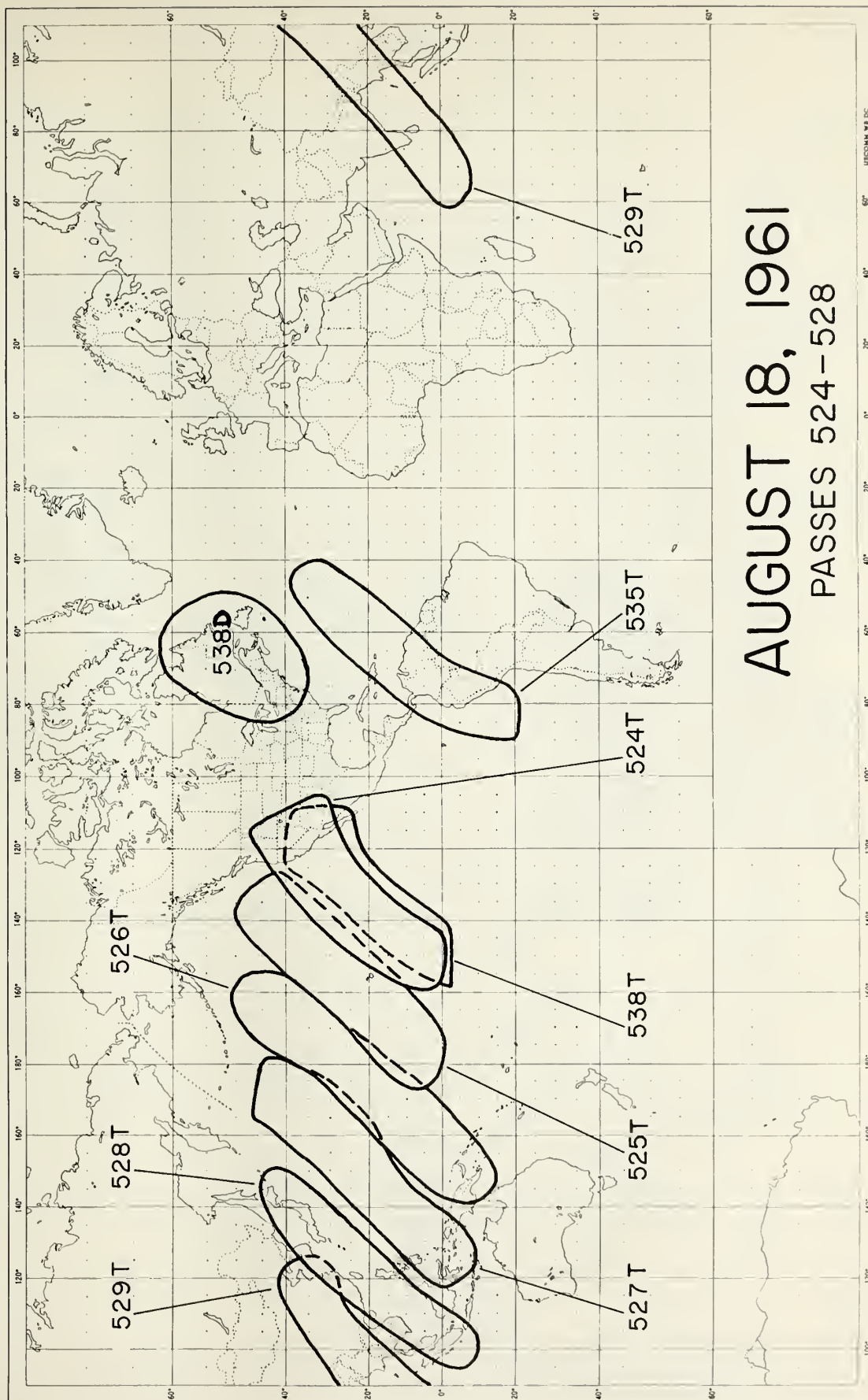




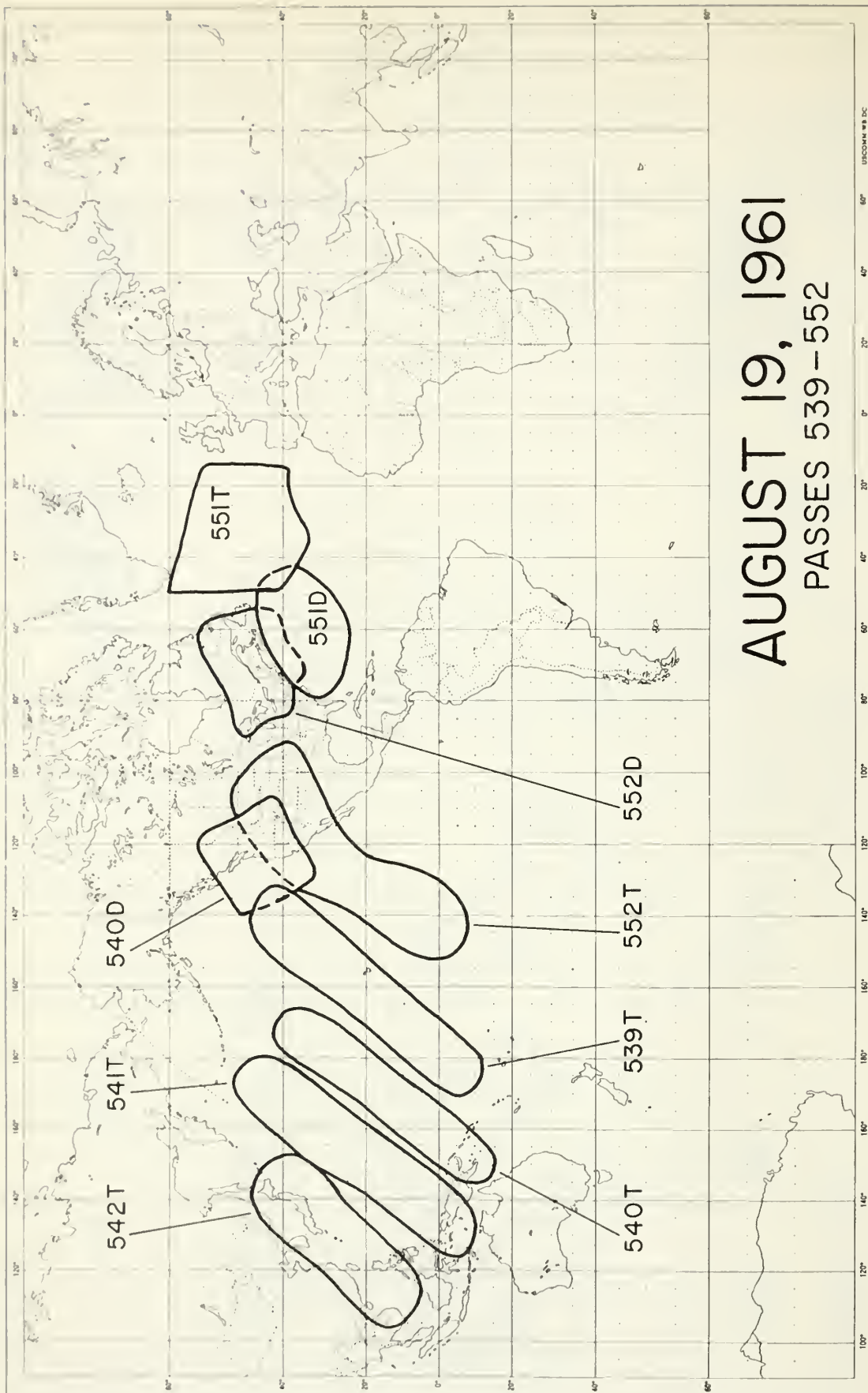
AUGUST 16, 1961  
PASSES 496-509

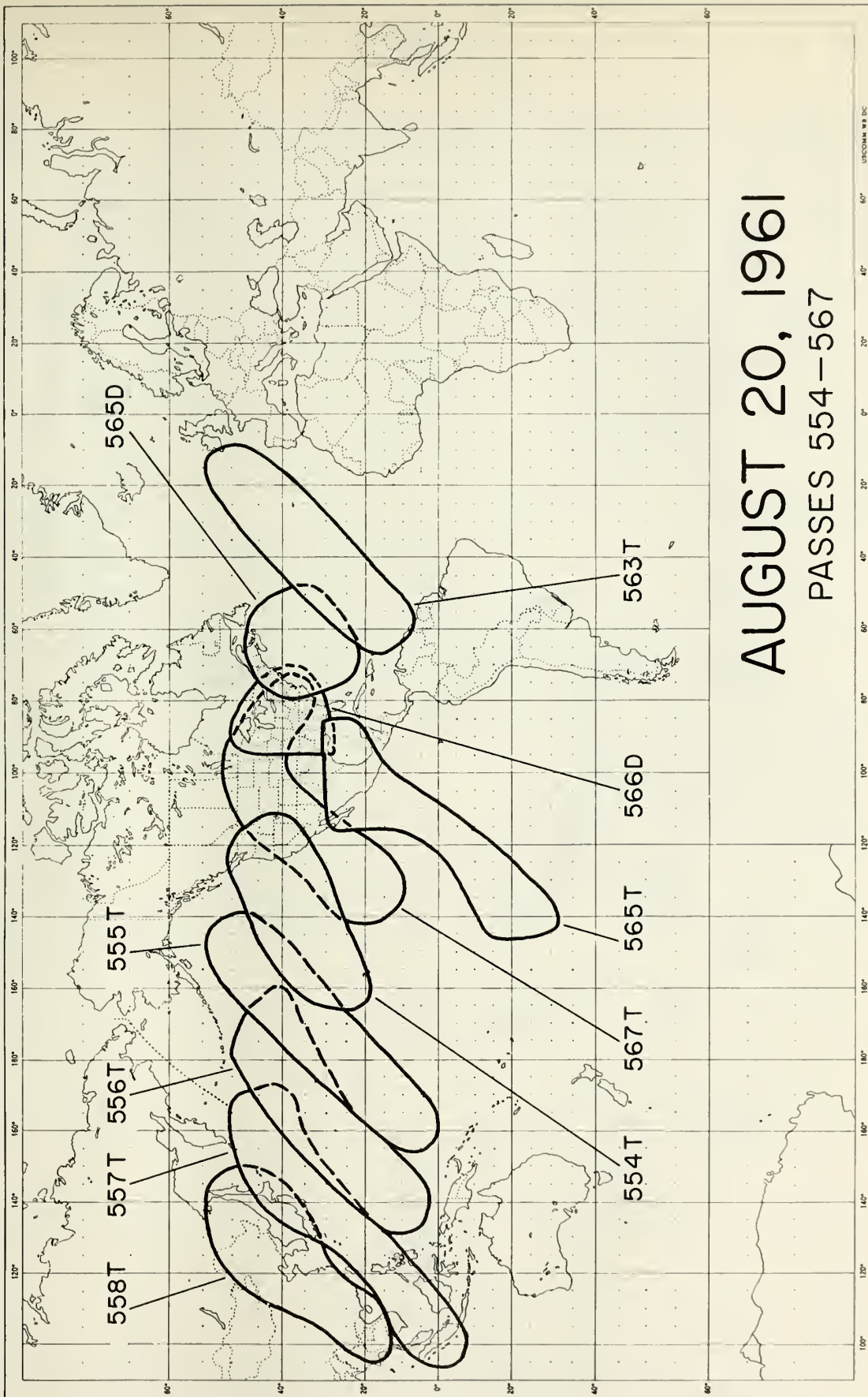




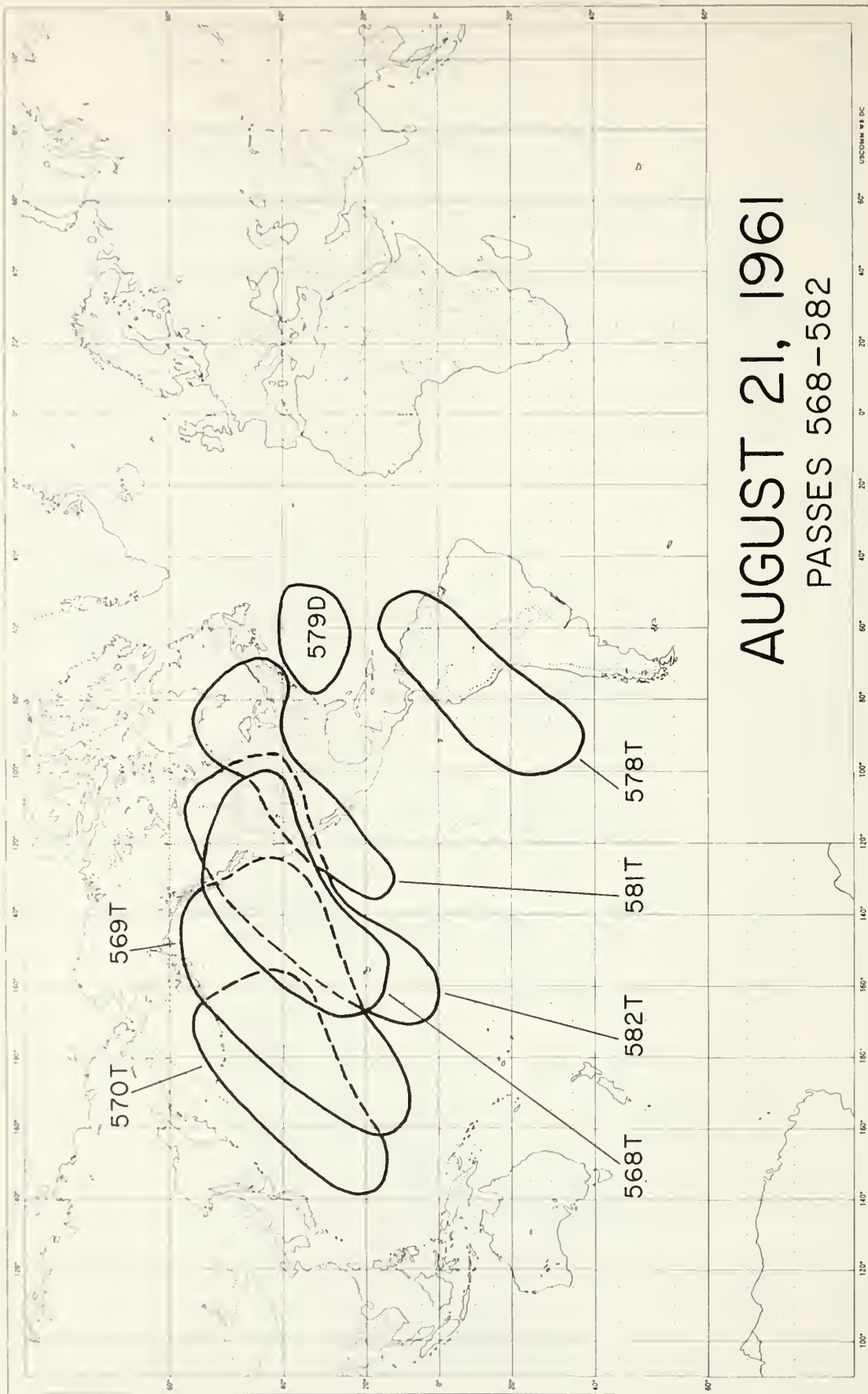


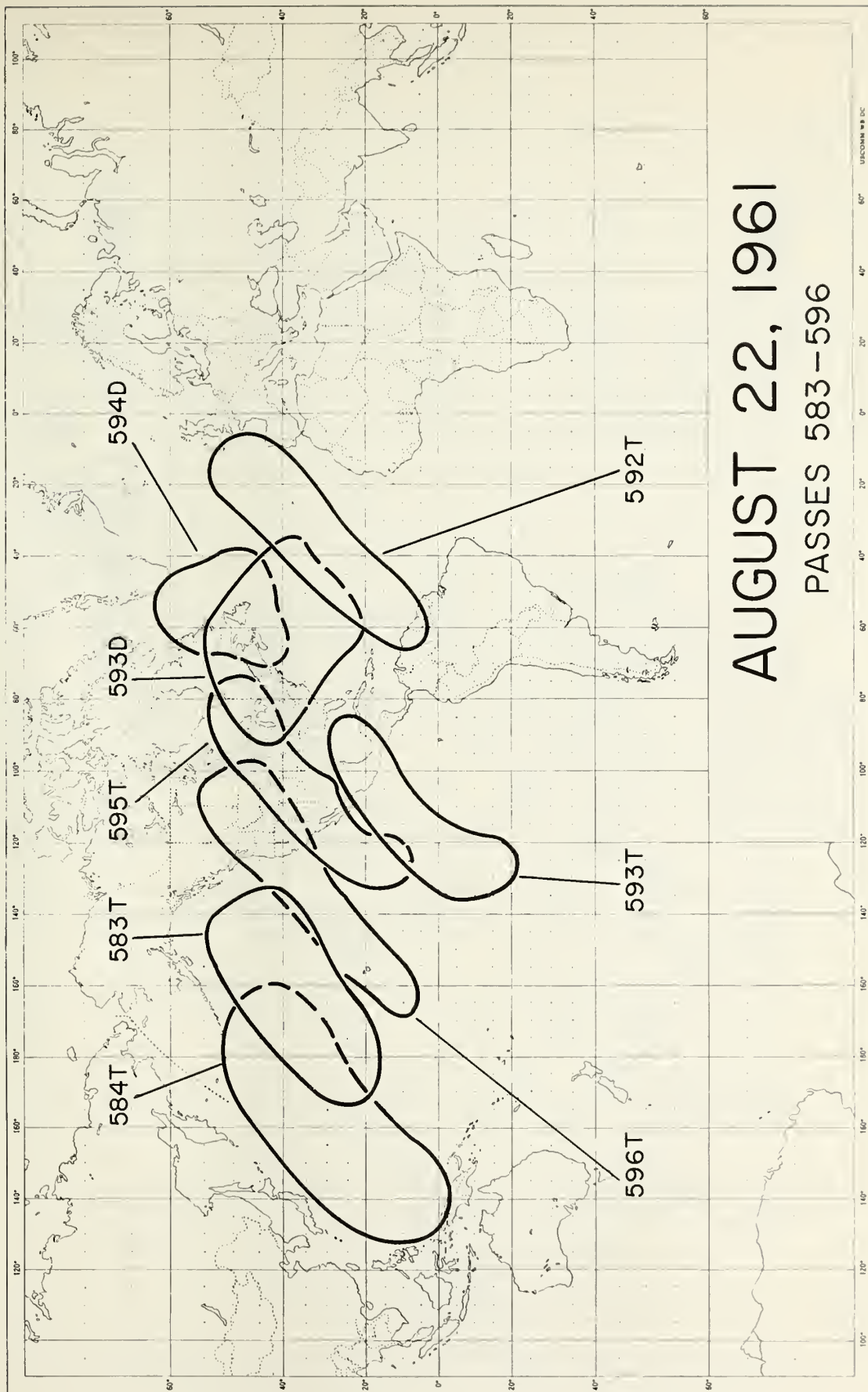
AUGUST 18, 1961  
PASSES 524-528



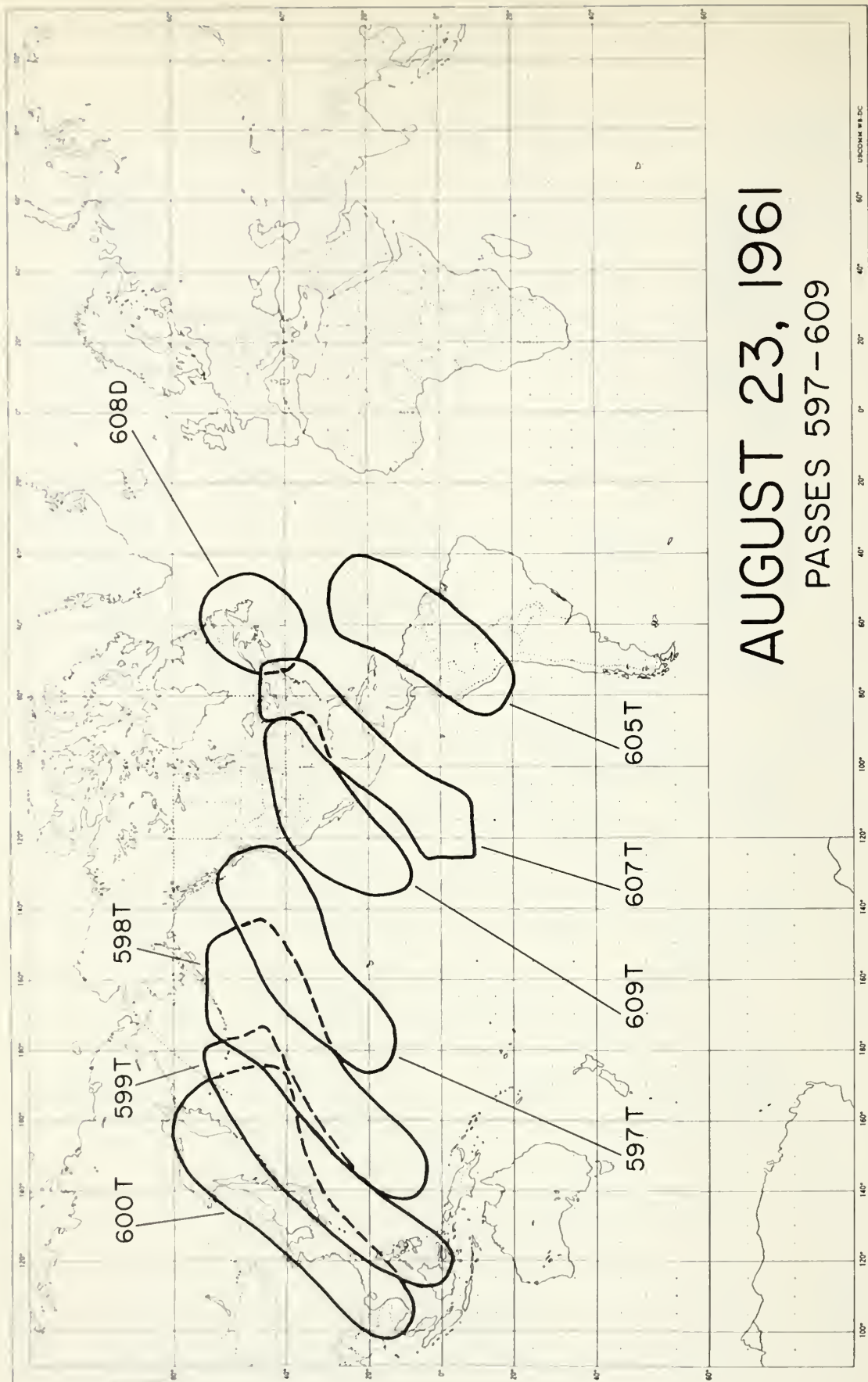




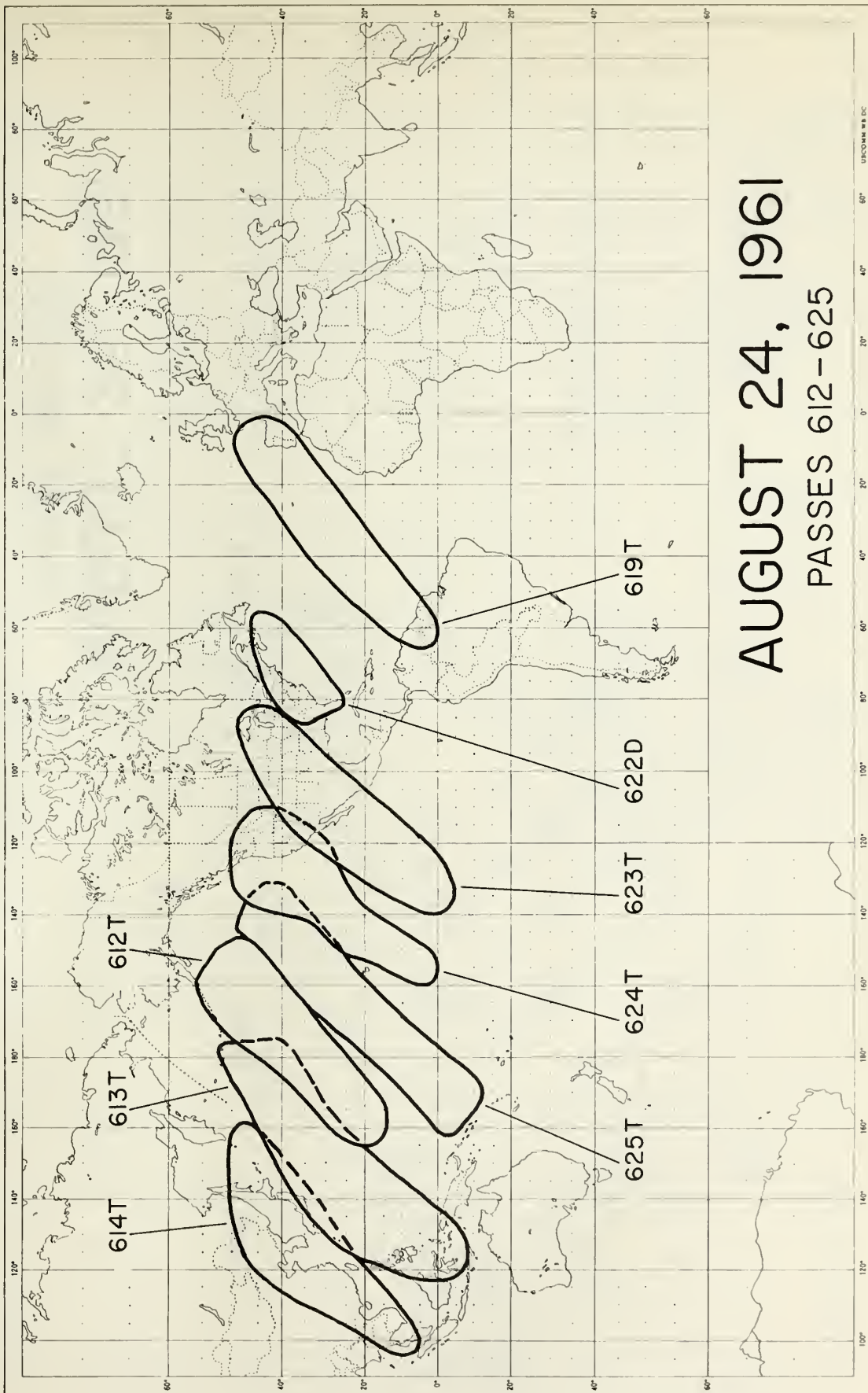


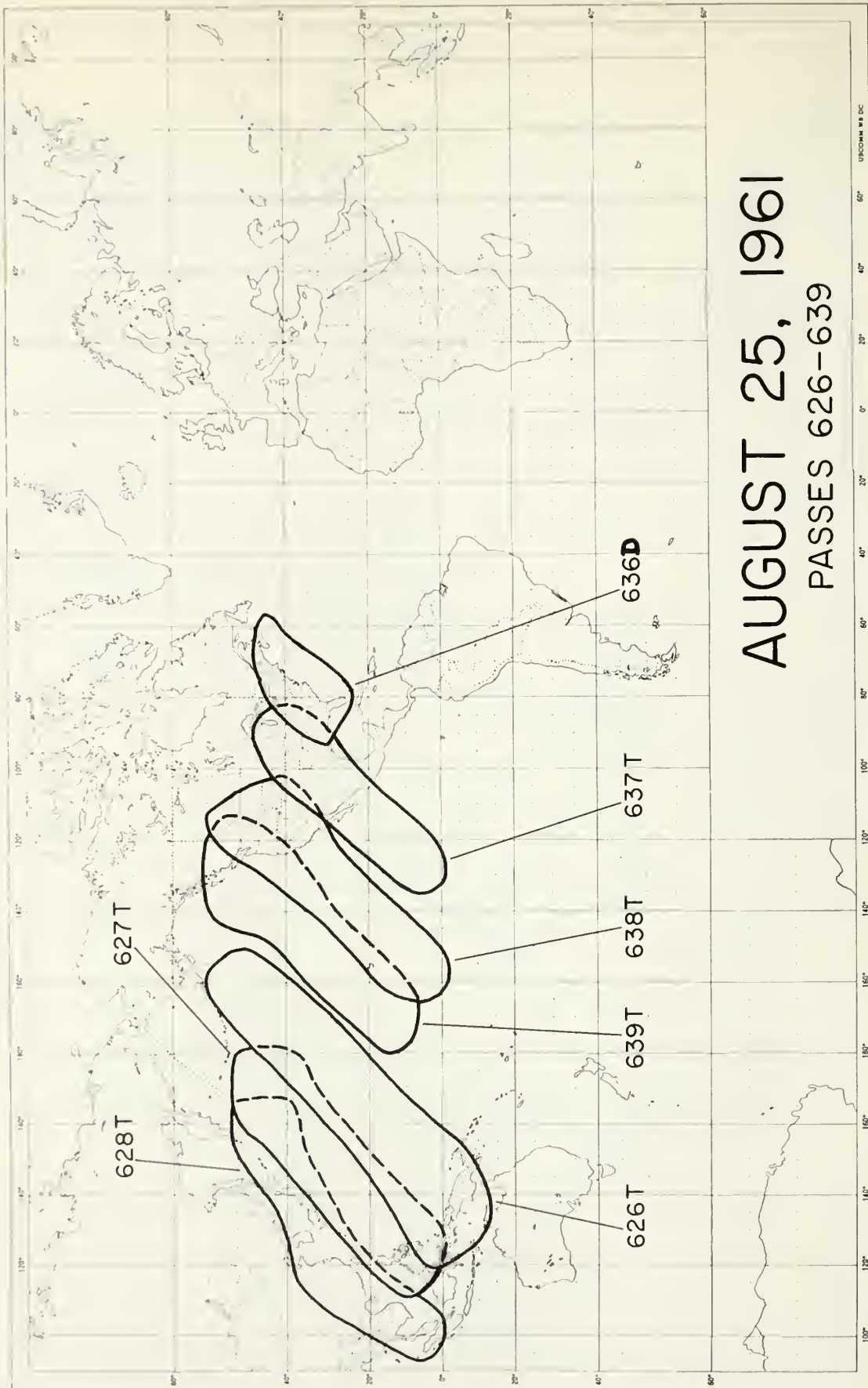


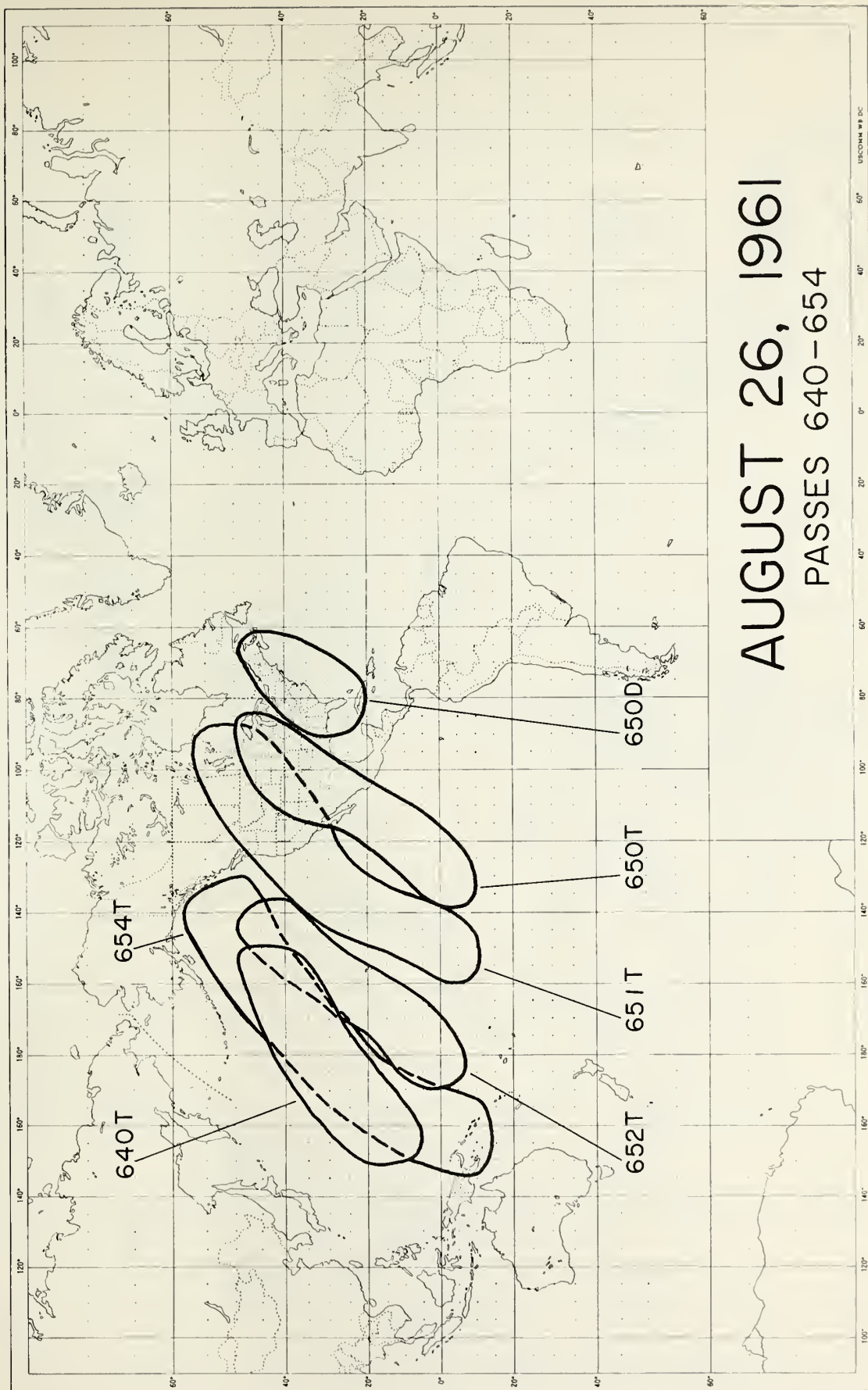
AUGUST 22, 1961  
PASSES 583-596



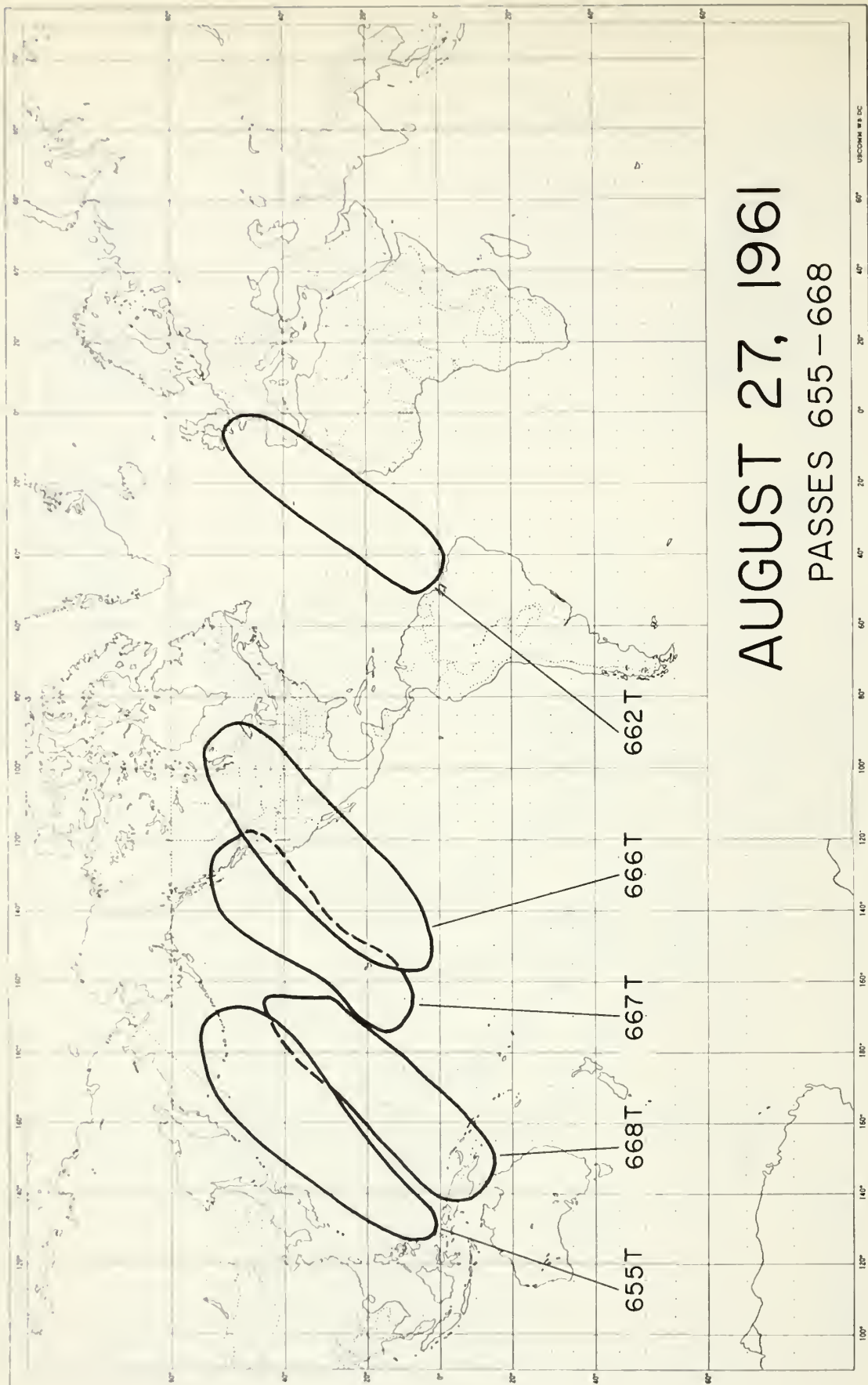




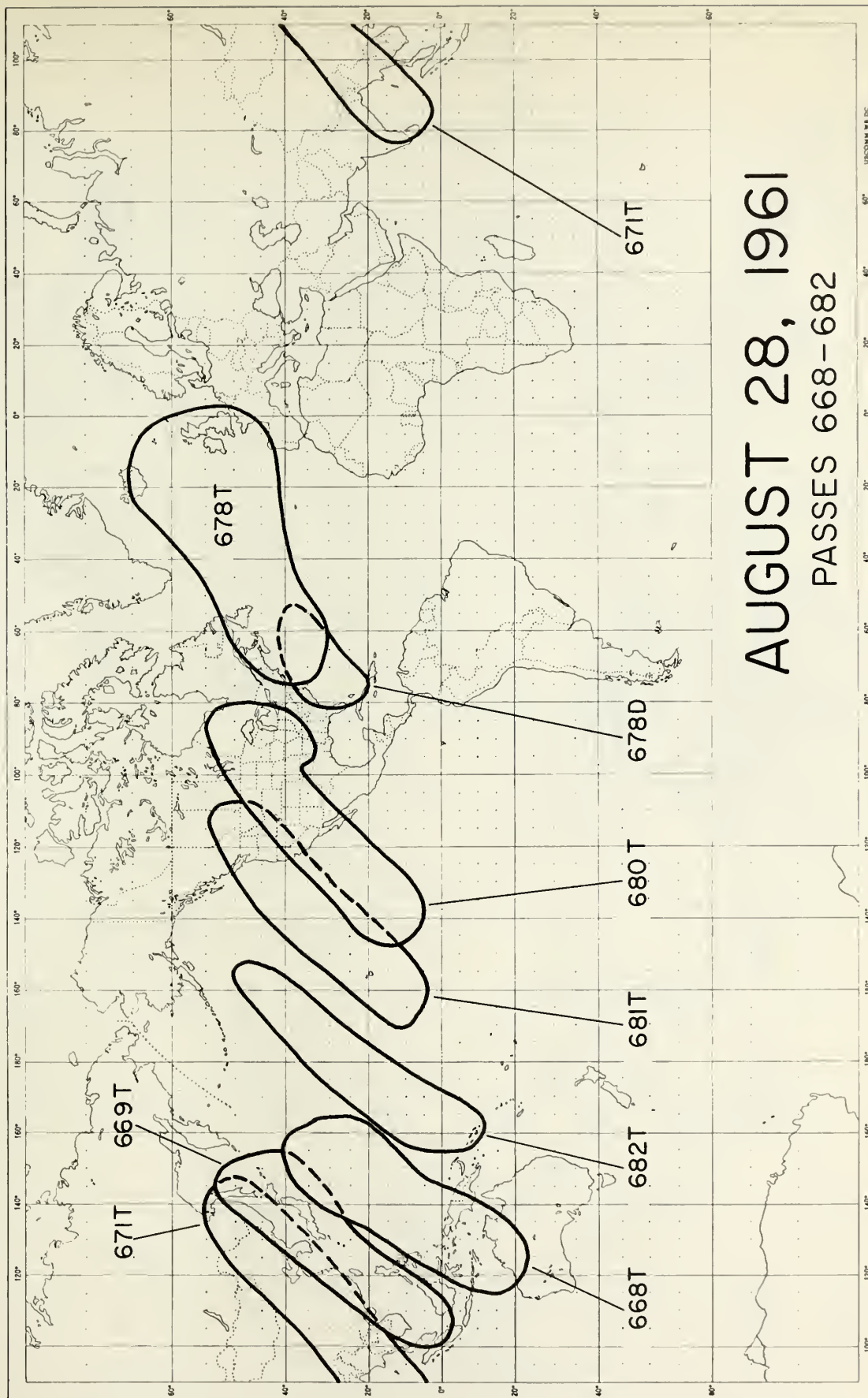


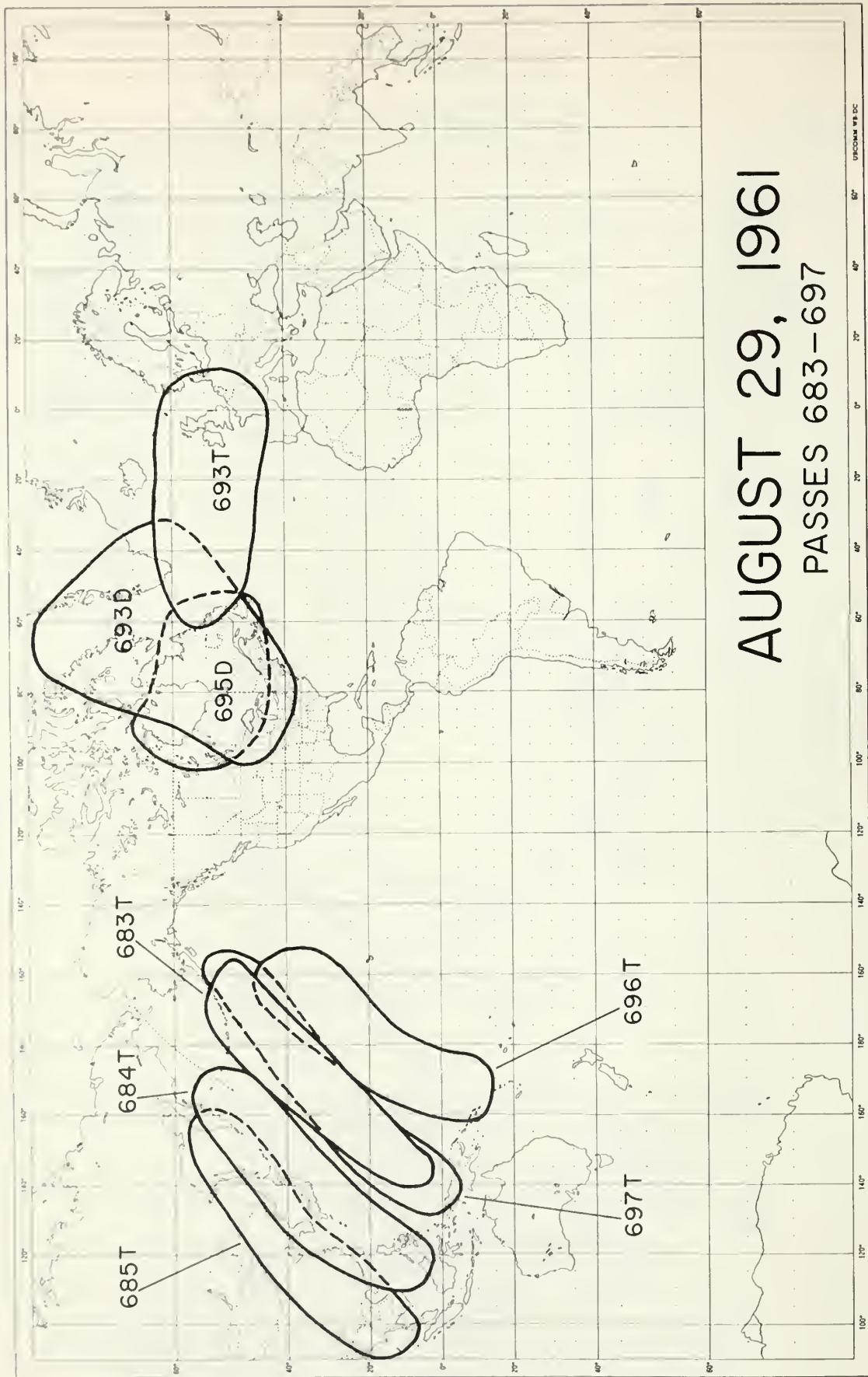




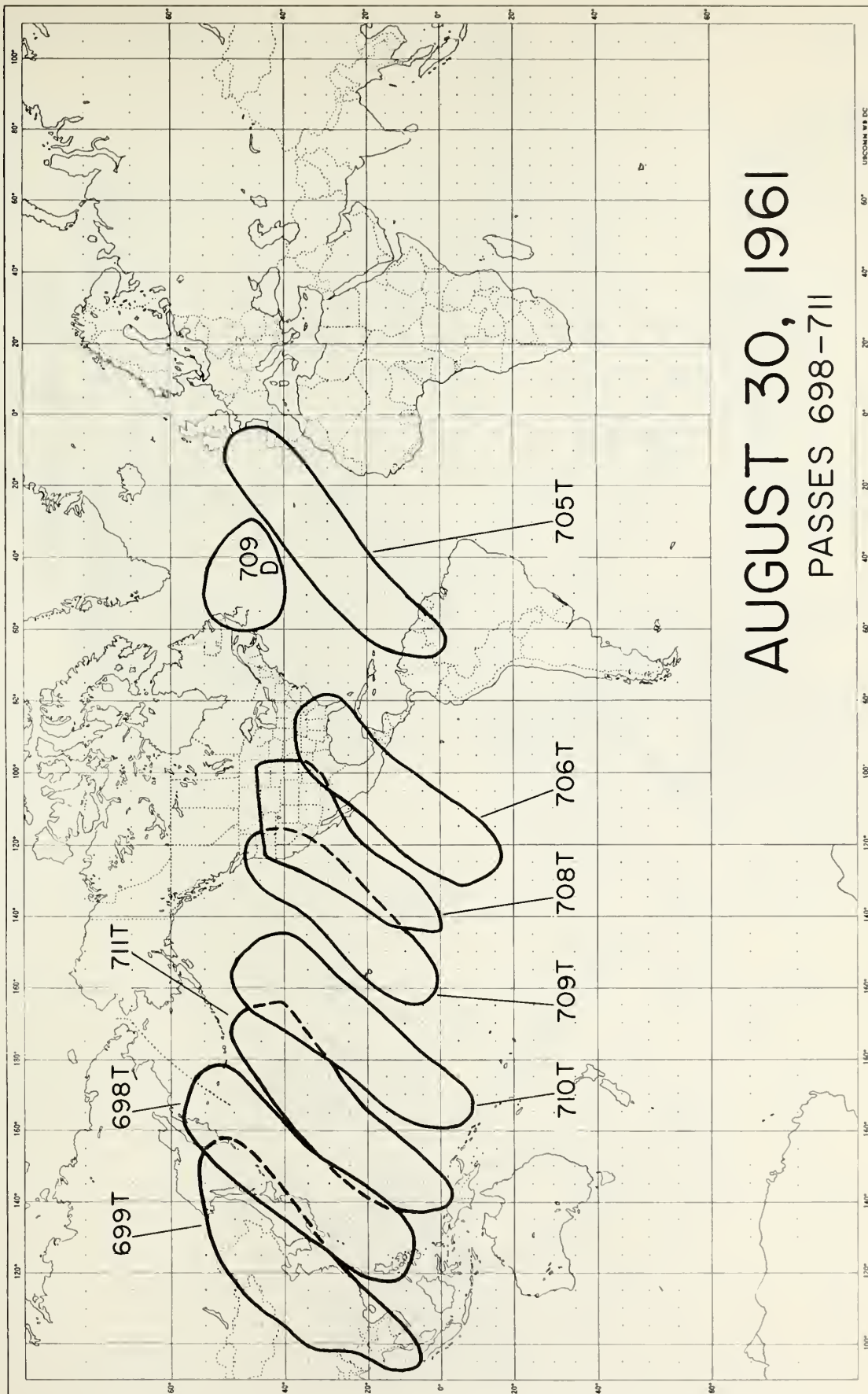


AUGUST 27, 1961  
PASSES 655-668

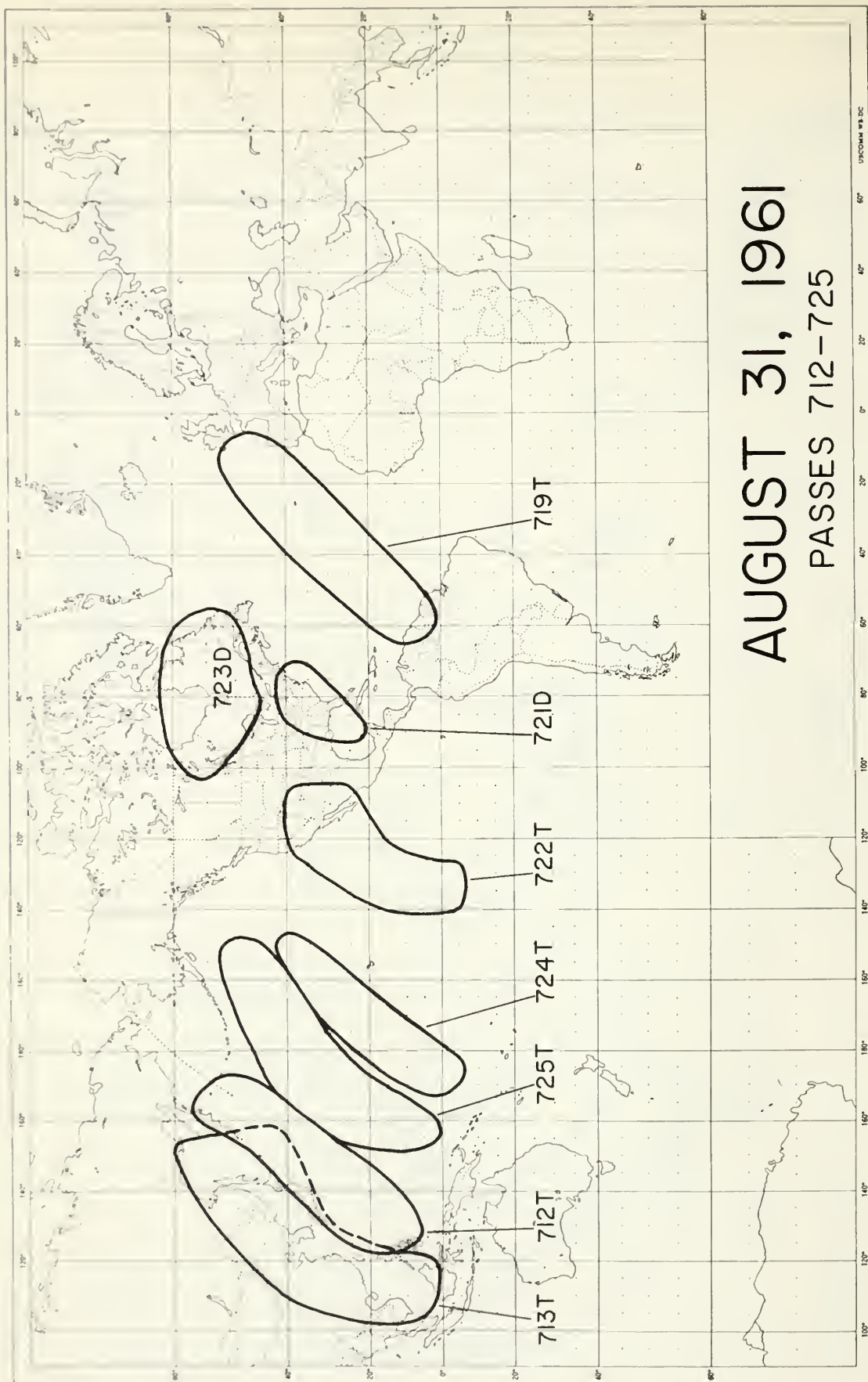






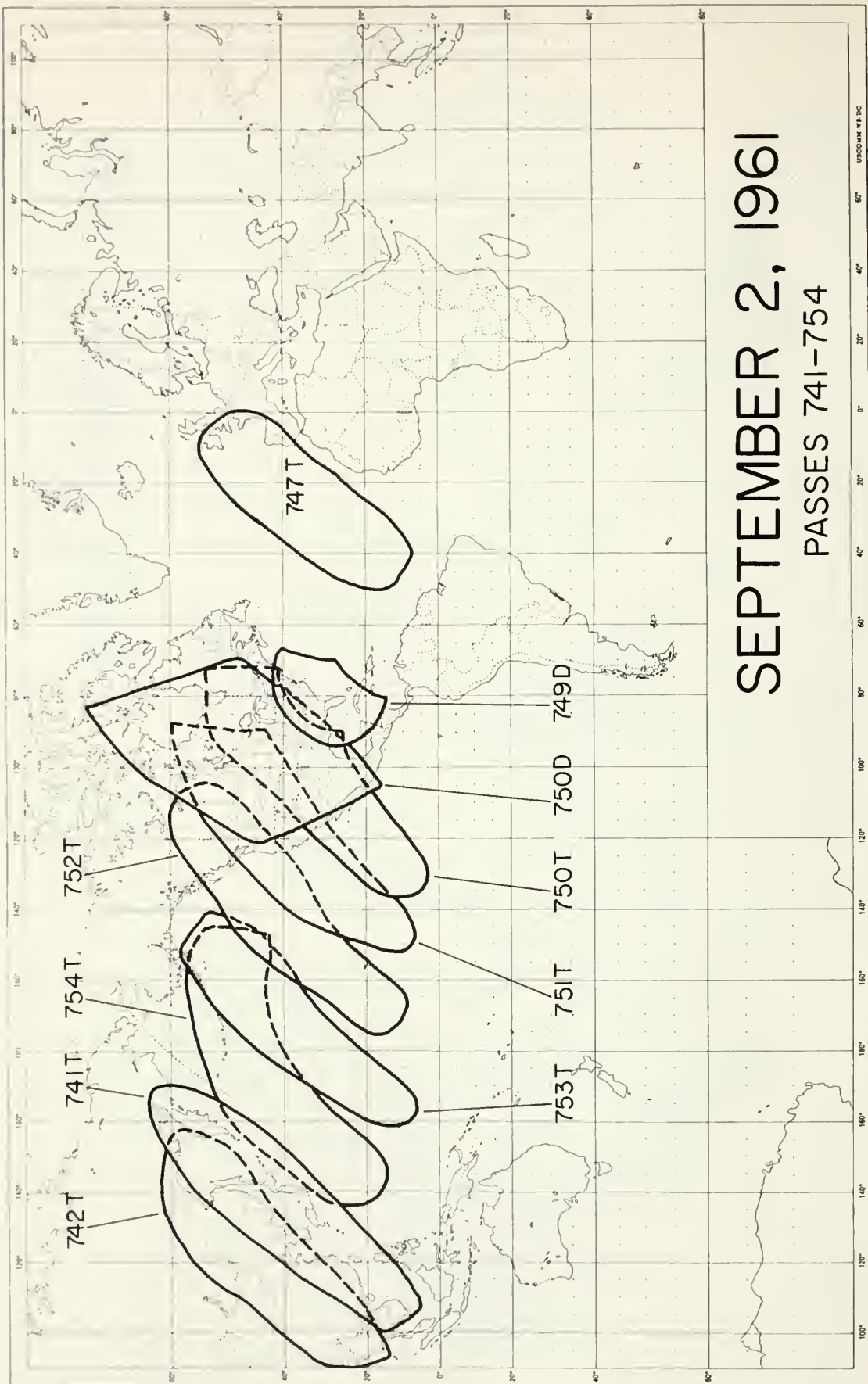


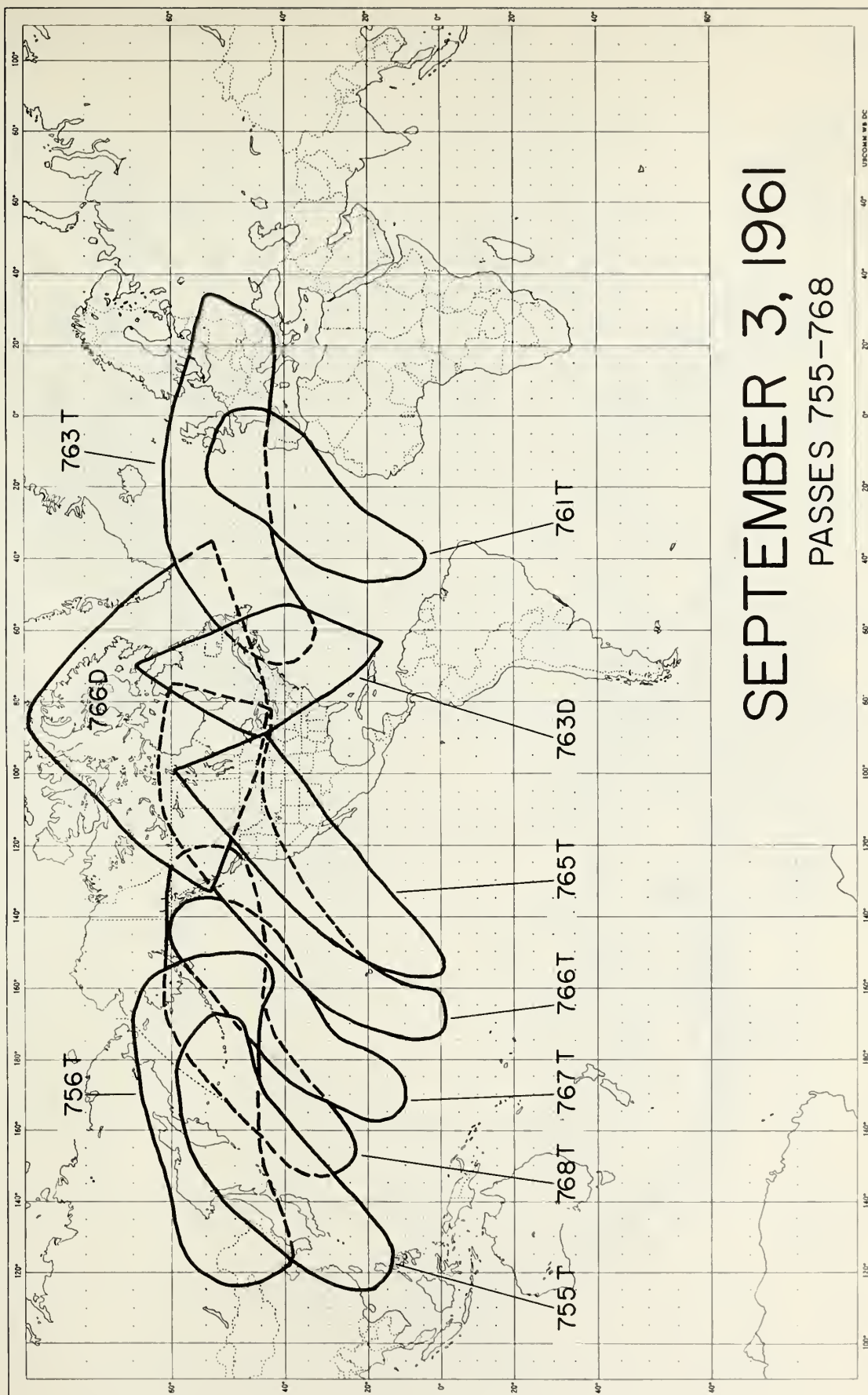
AUGUST 30, 1961  
PASSES 698-711

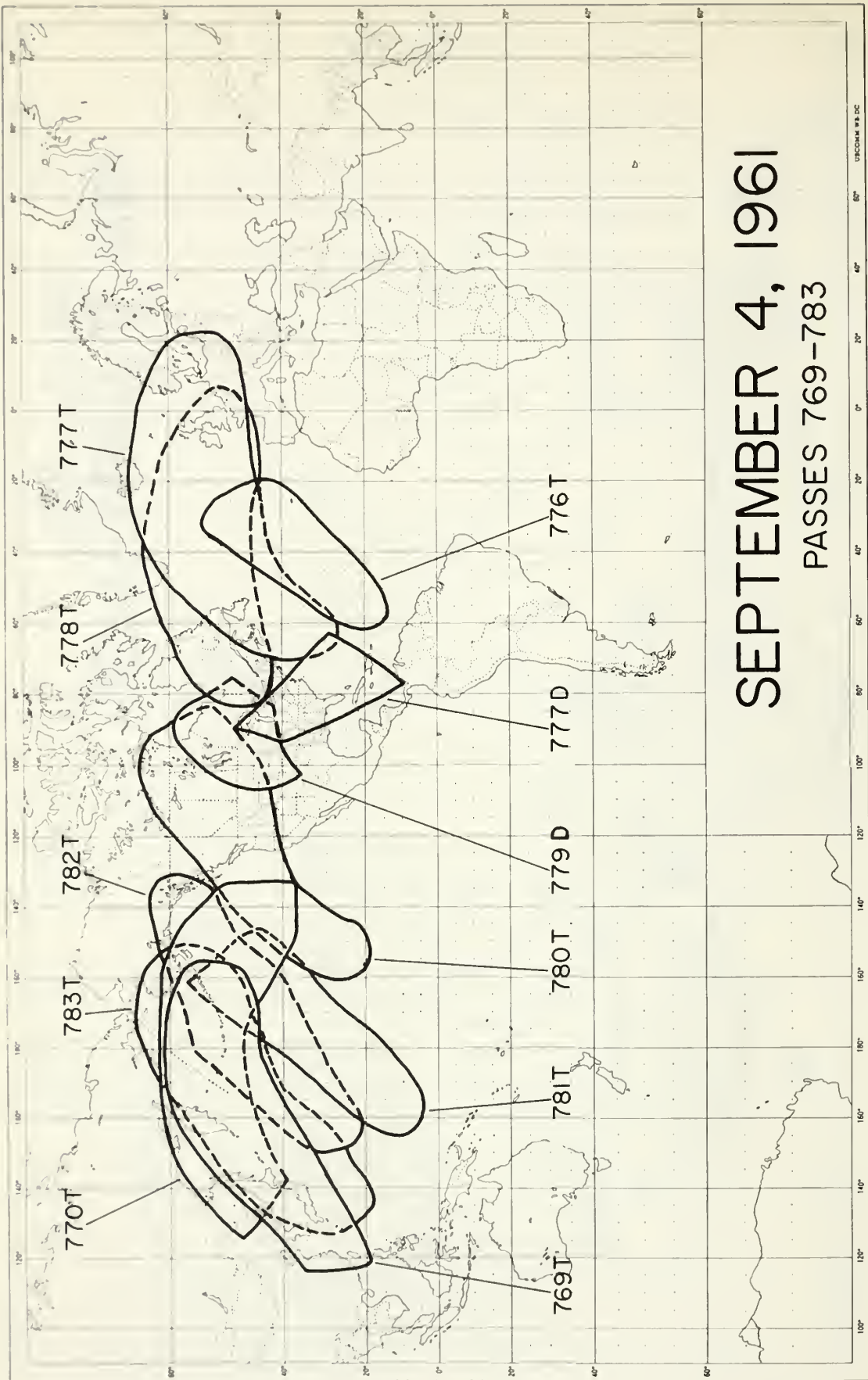




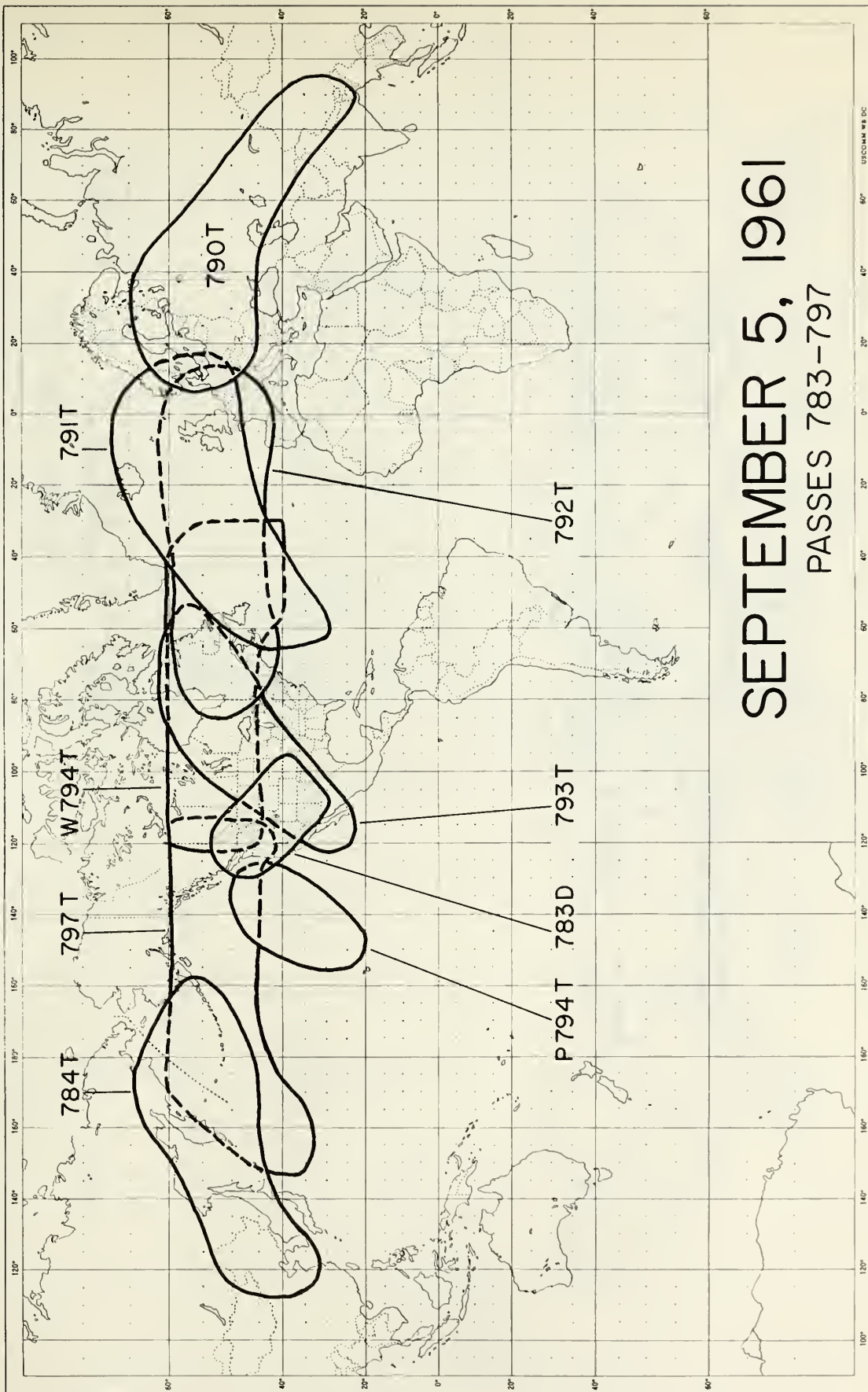


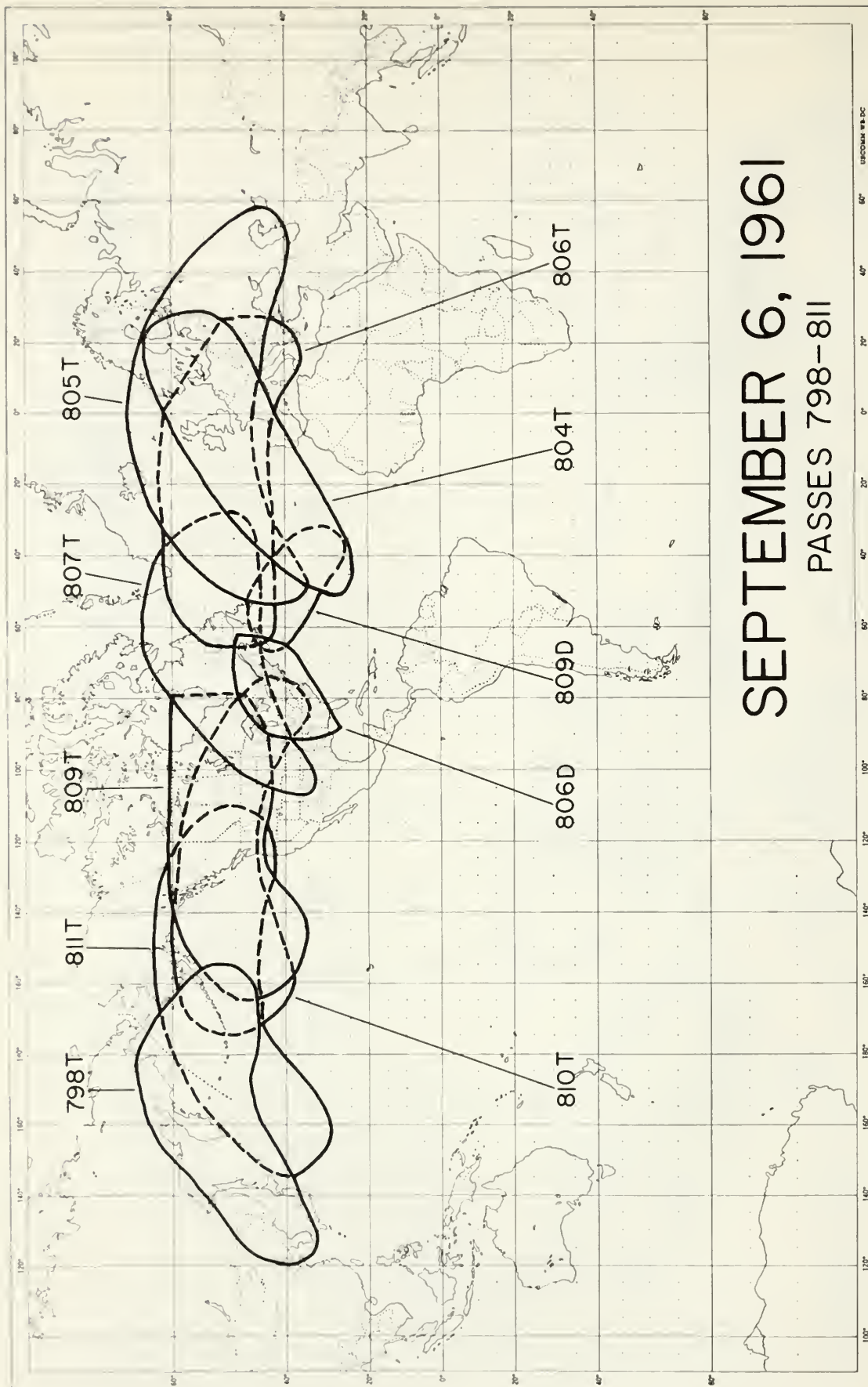


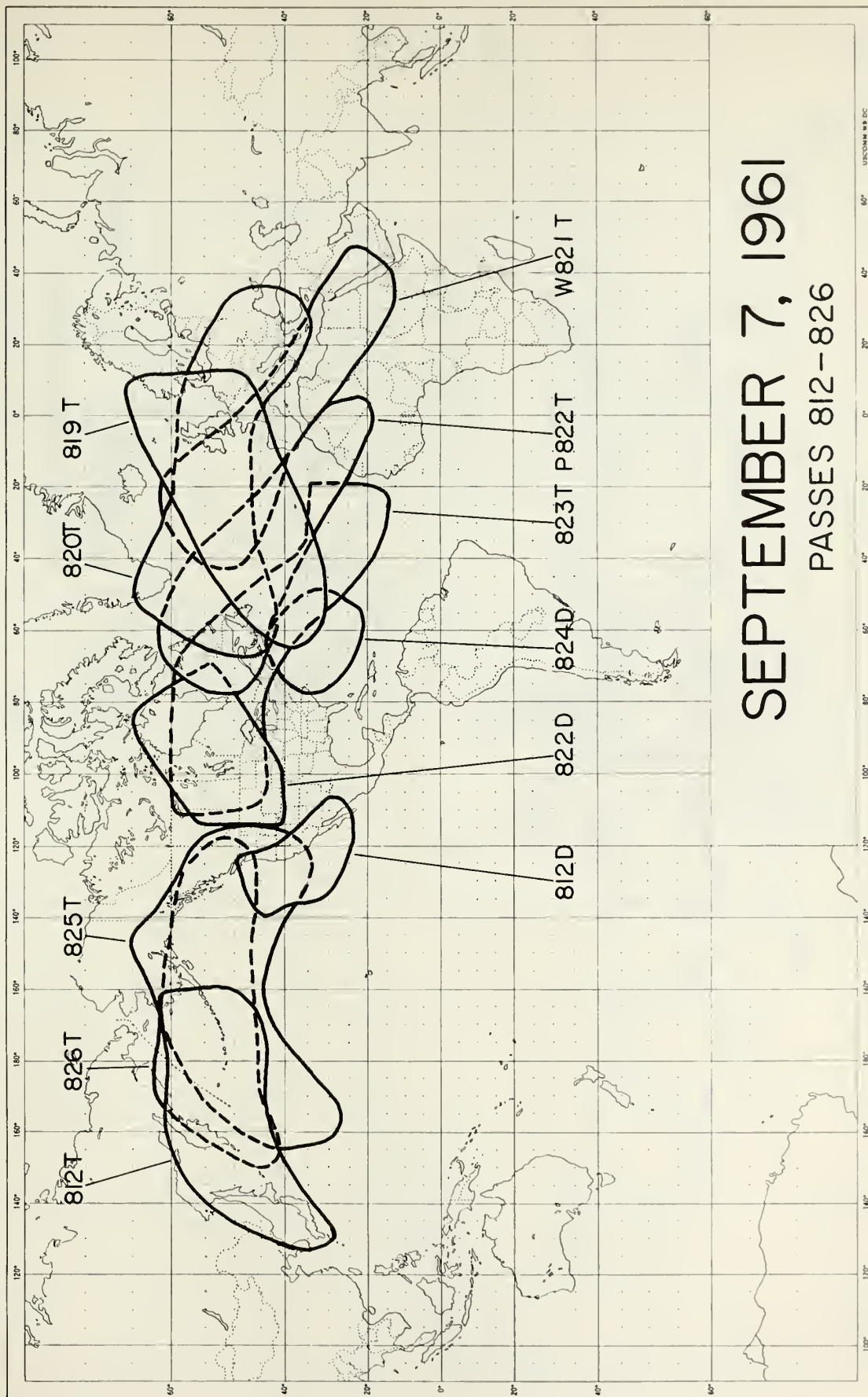




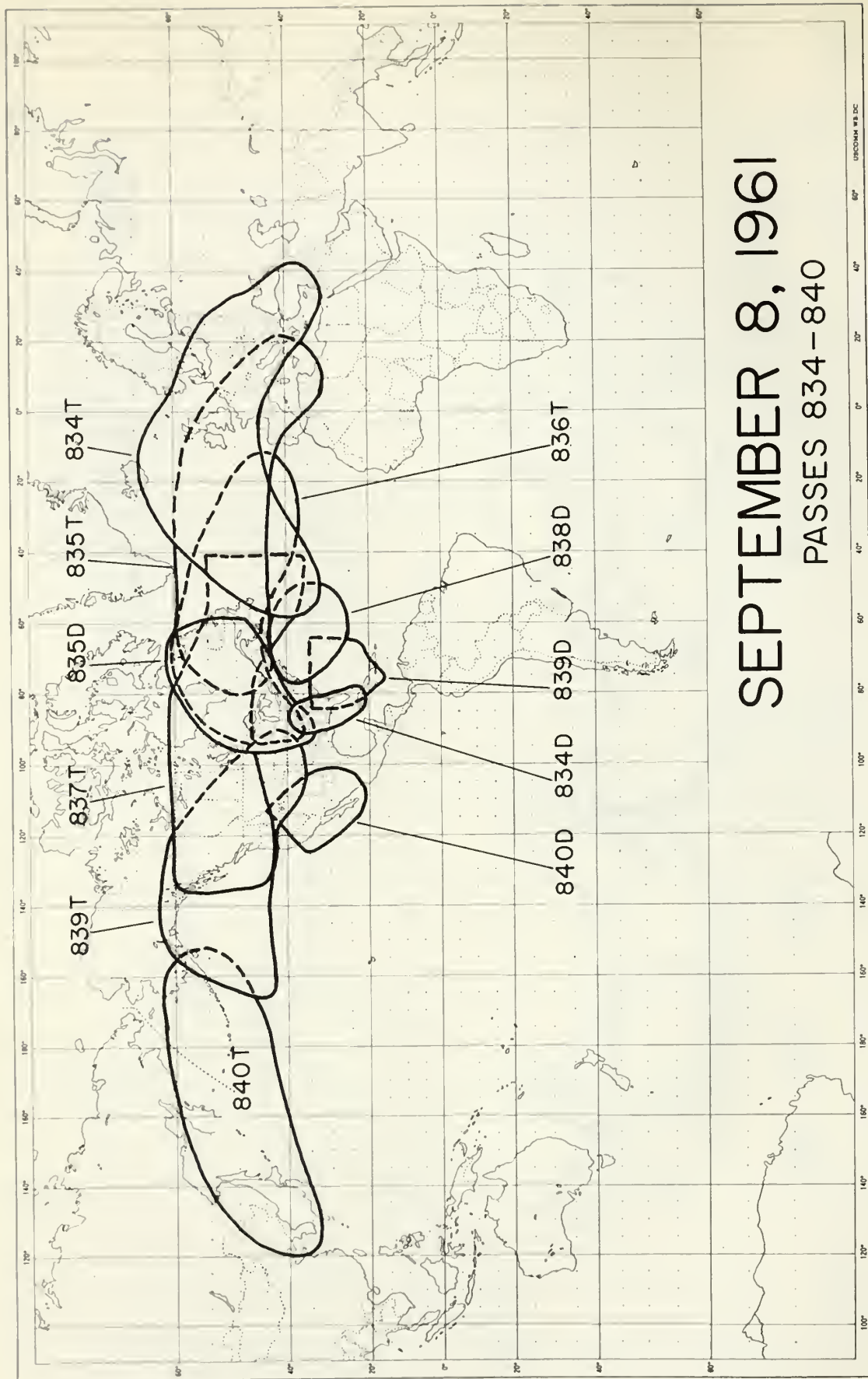


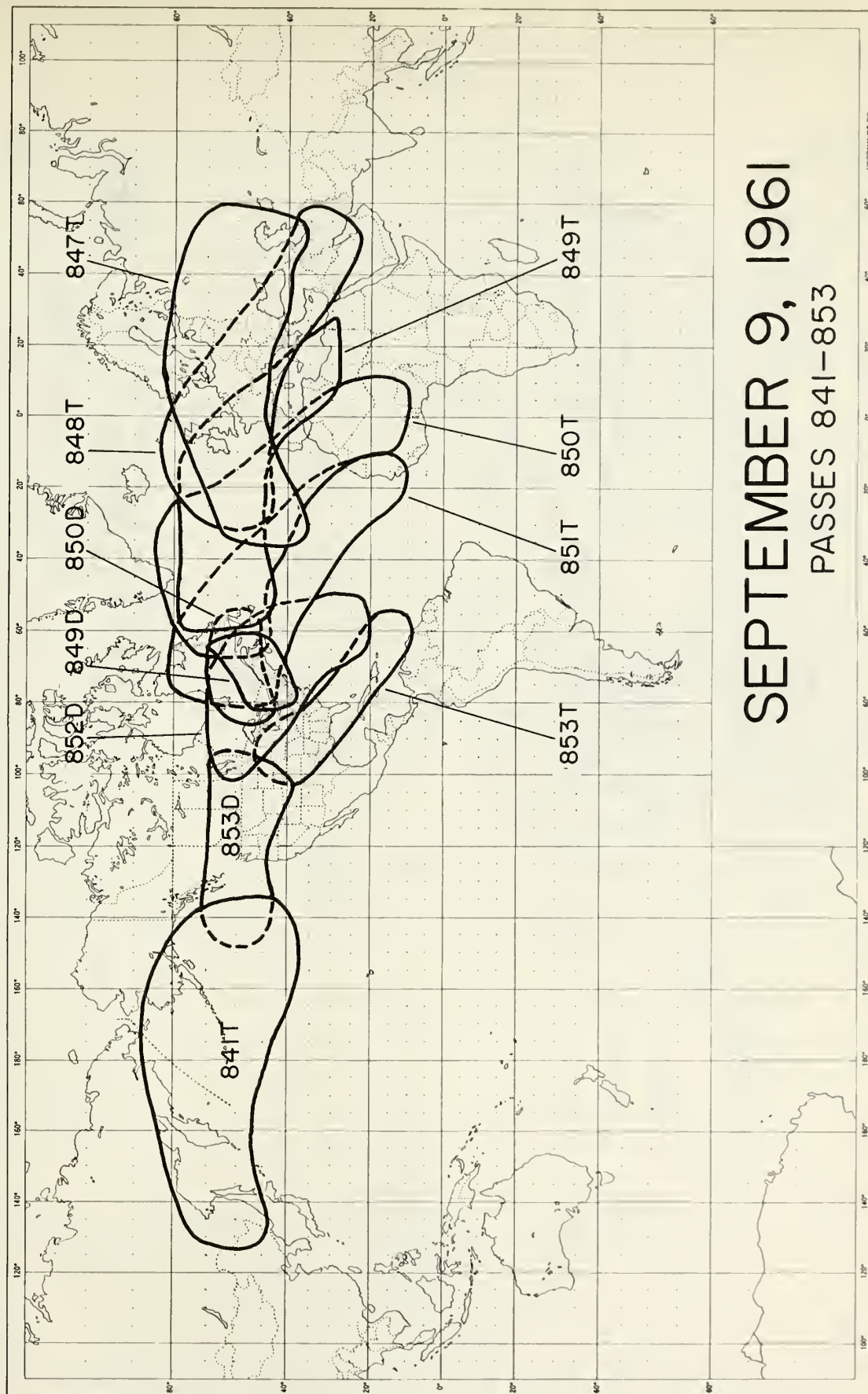






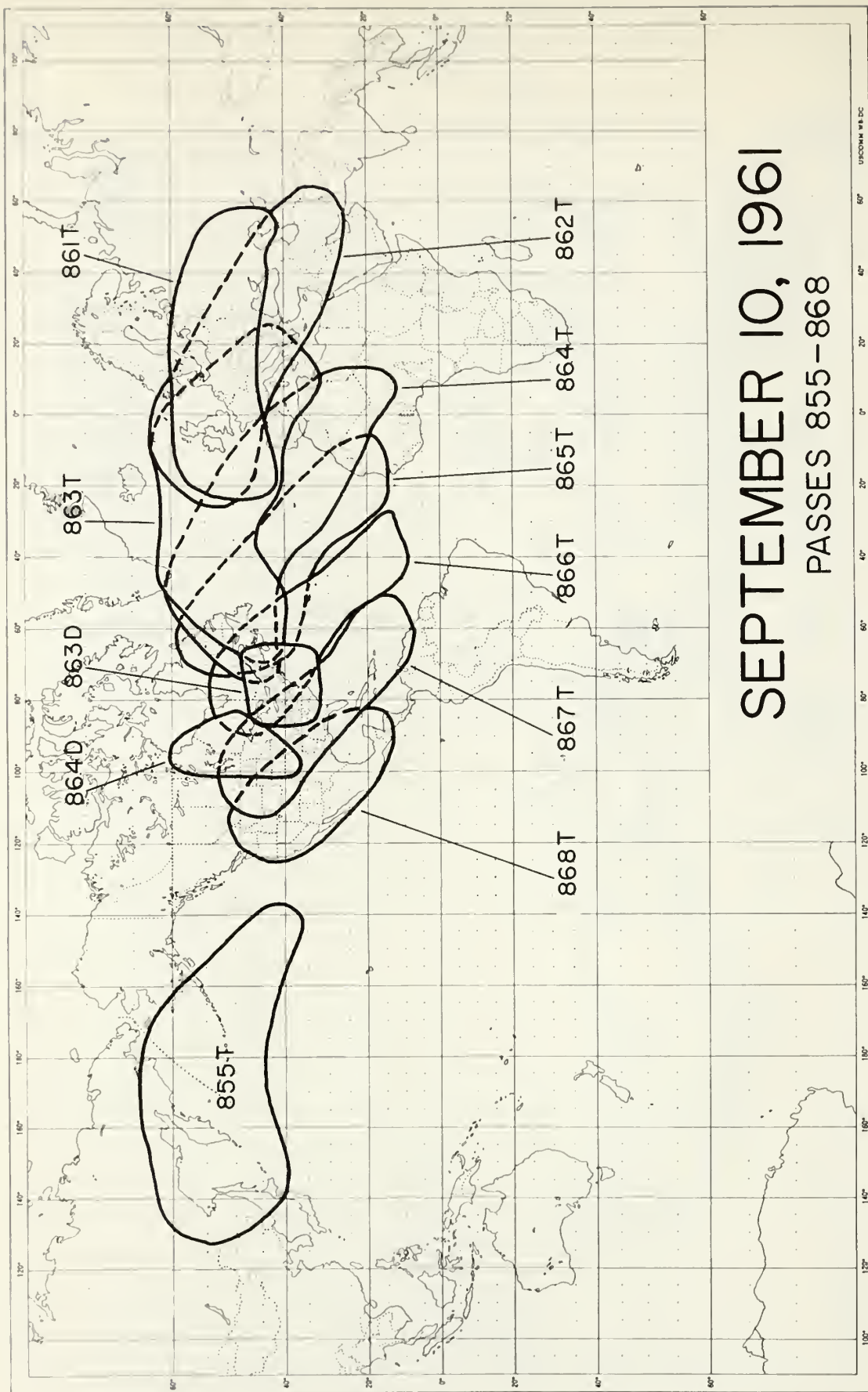




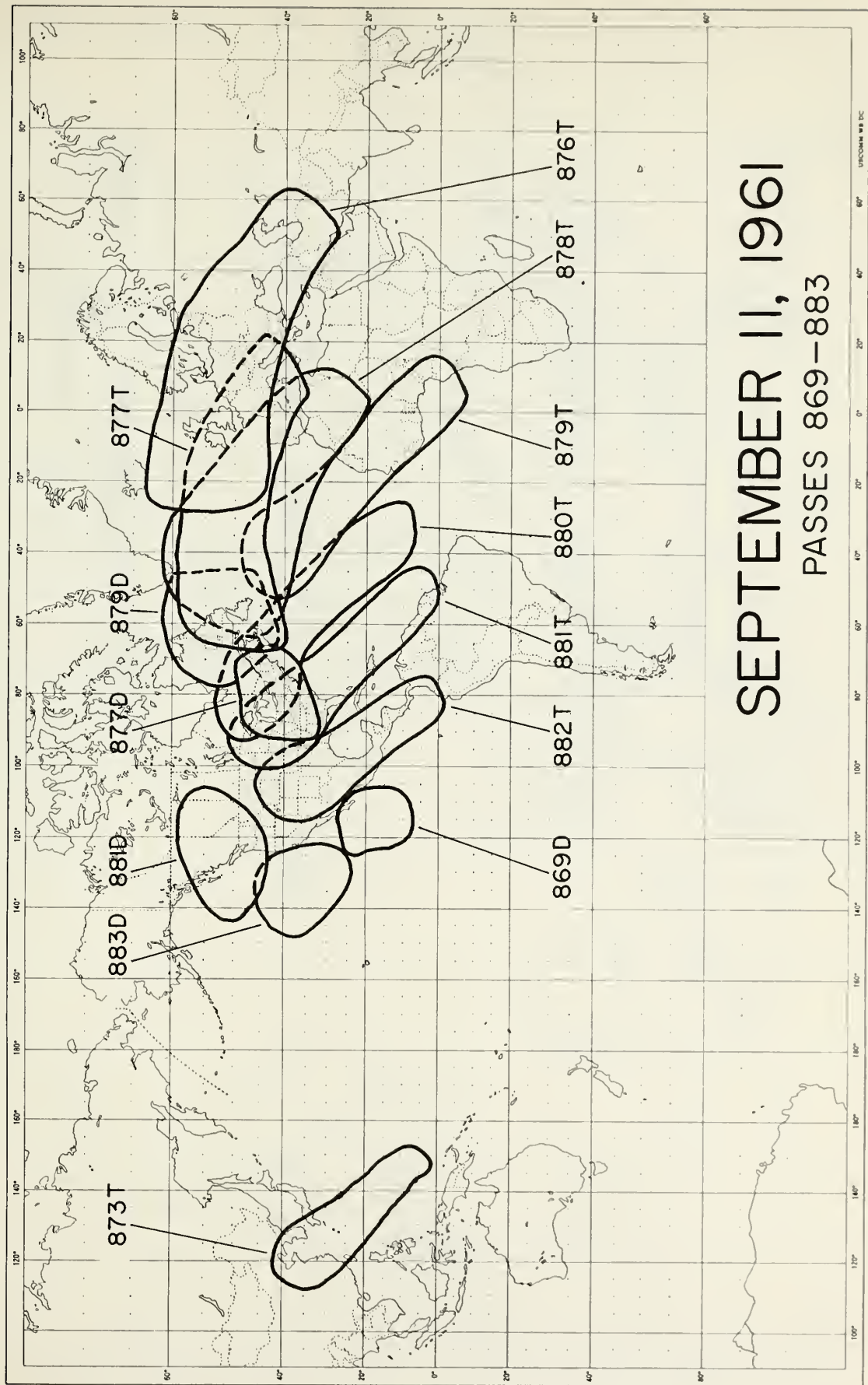


SEPTEMBER 9, 1961  
PASSES 841-853

UNCOMB #18 DC

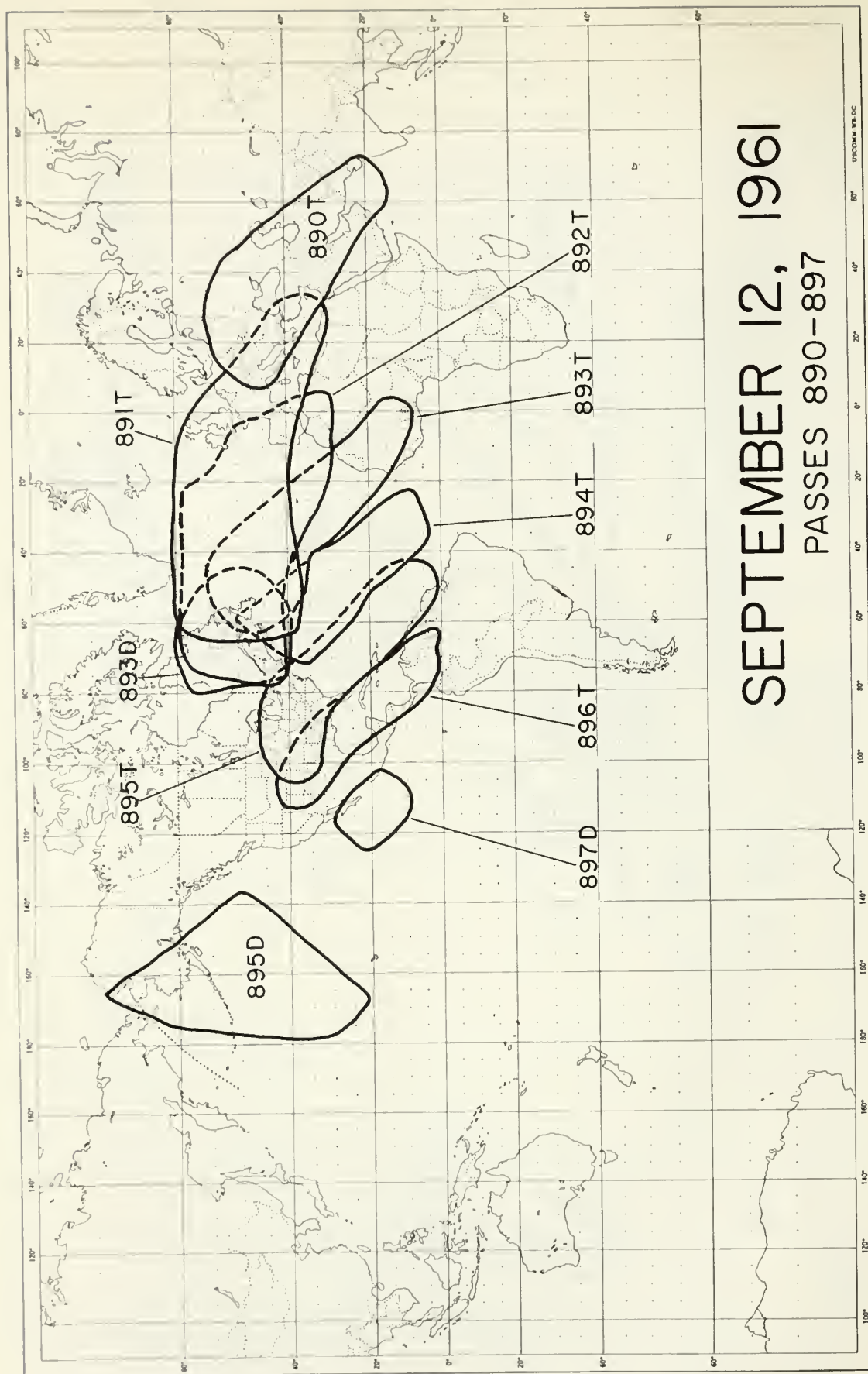






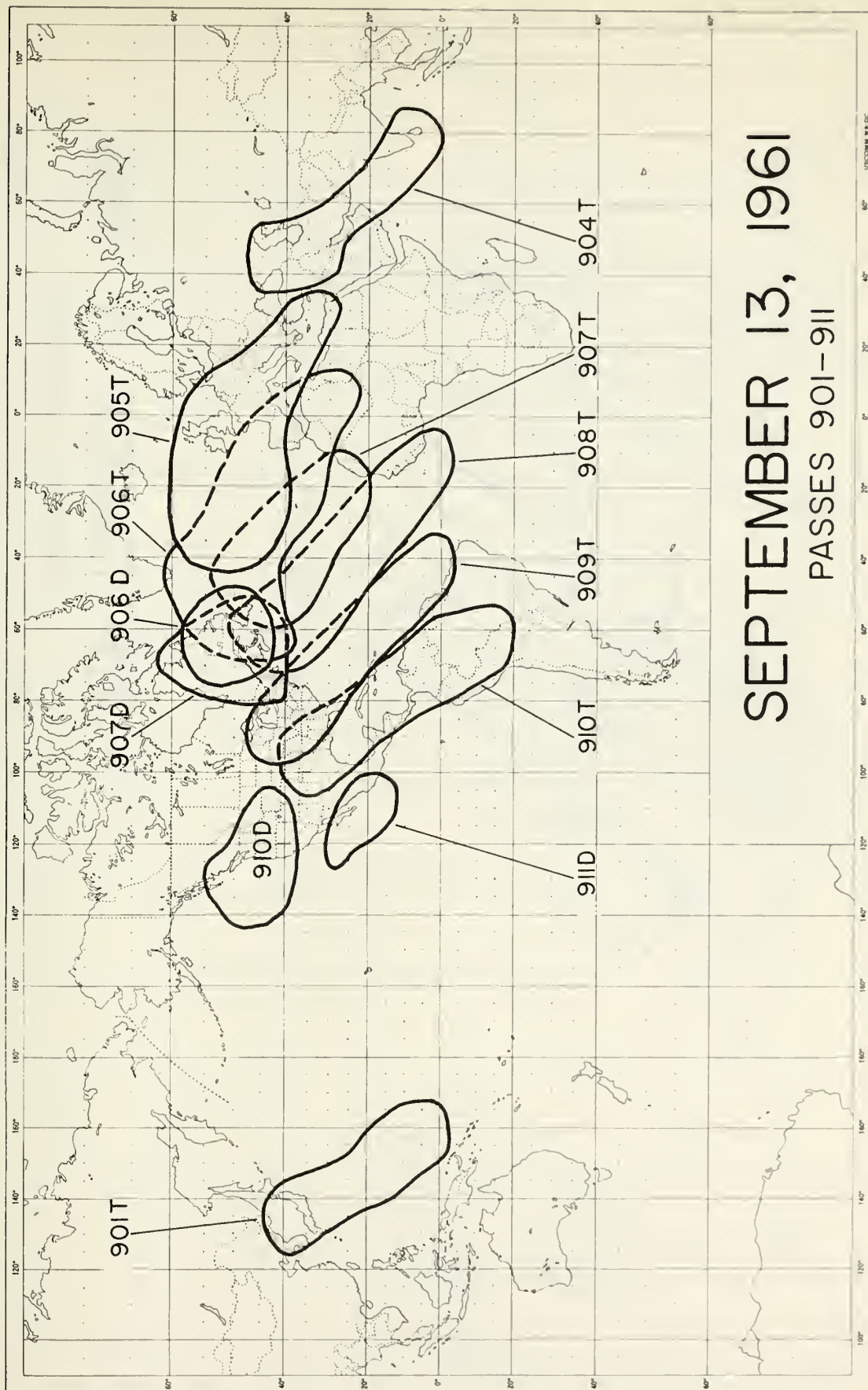
# SEPTEMBER 11, 1961

## PASSES 869-883



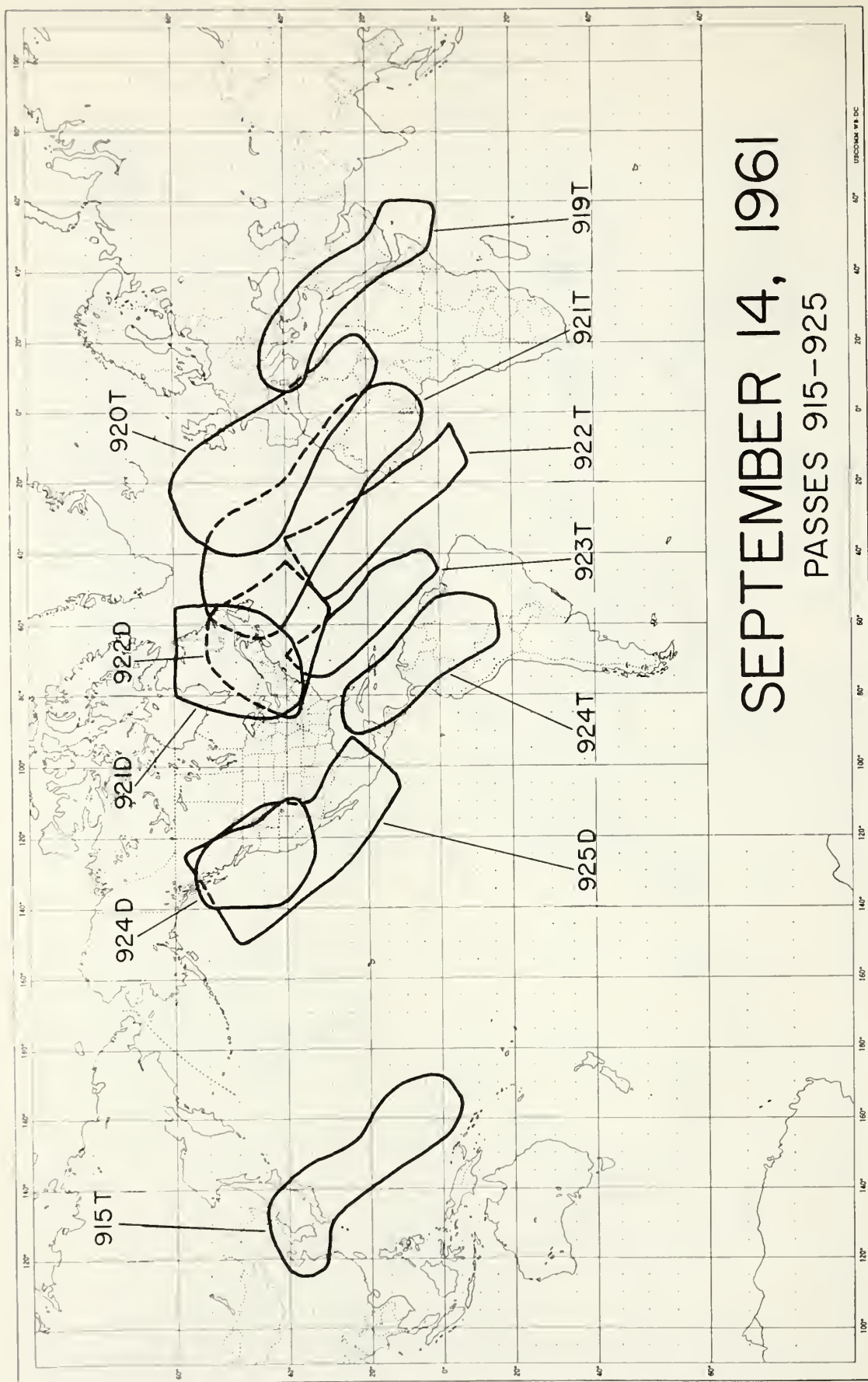
SEPTEMBER 12, 1961  
PASSES 890-897

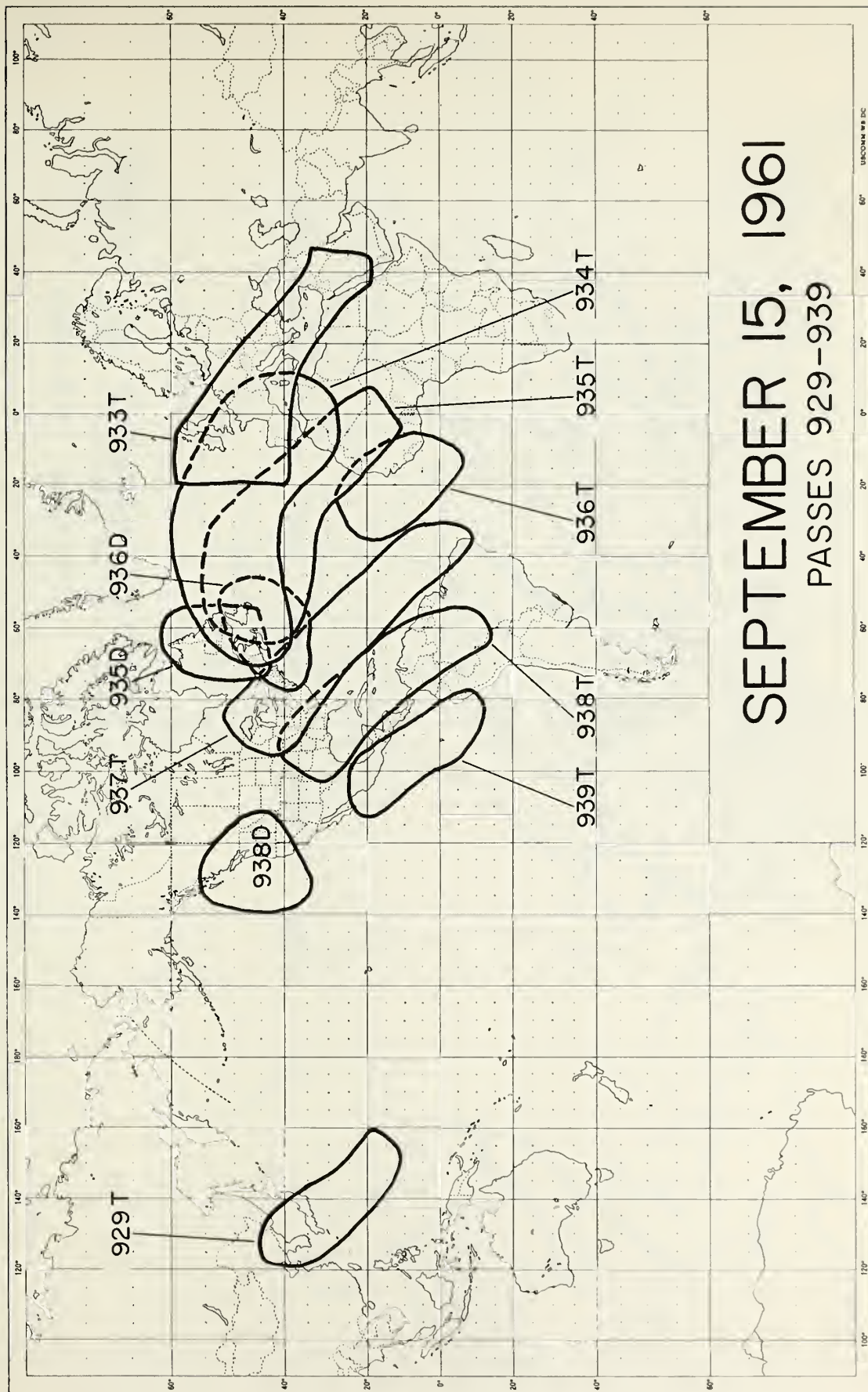
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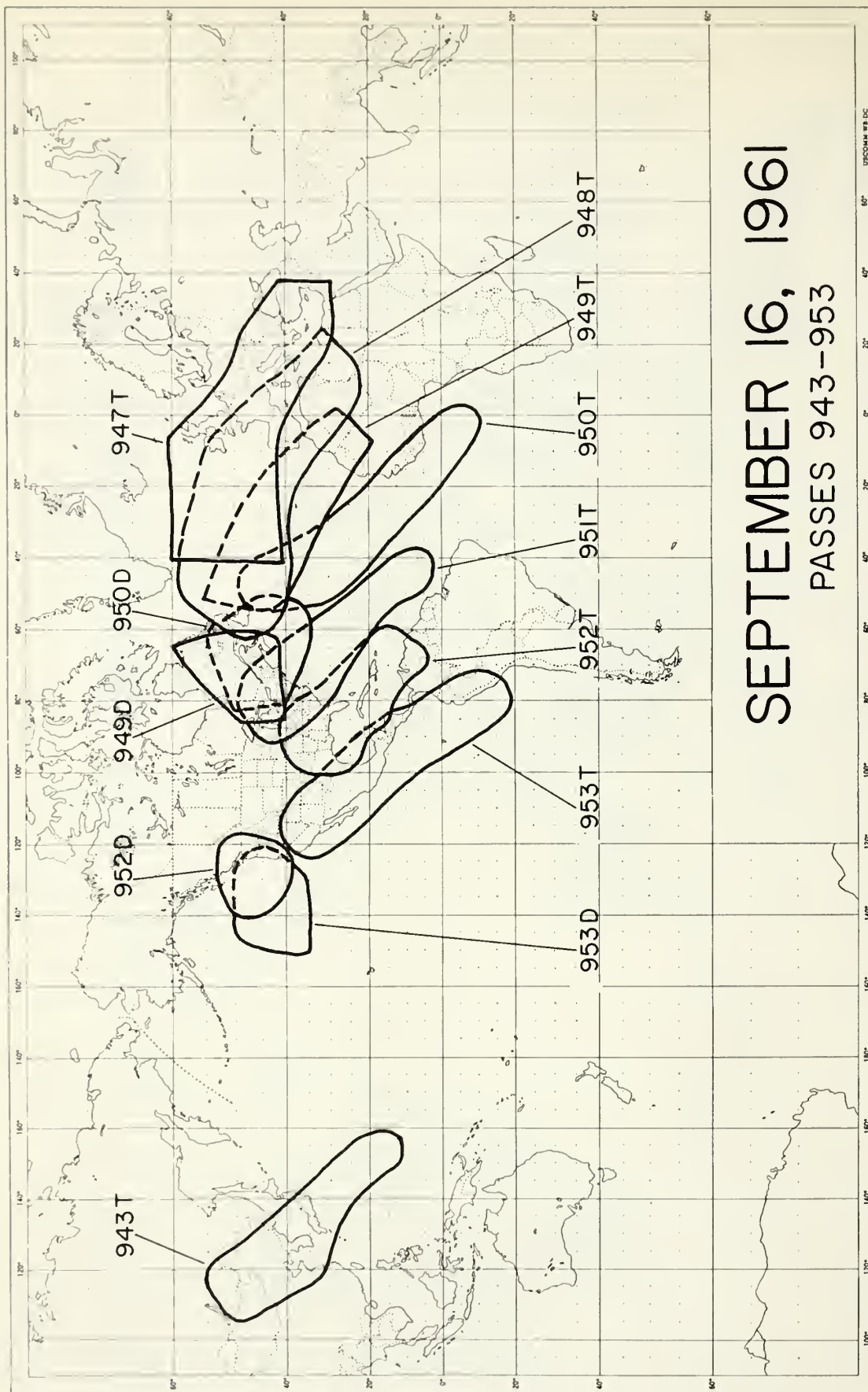


SEPTEMBER 13, 1961  
 PASSES 901-911

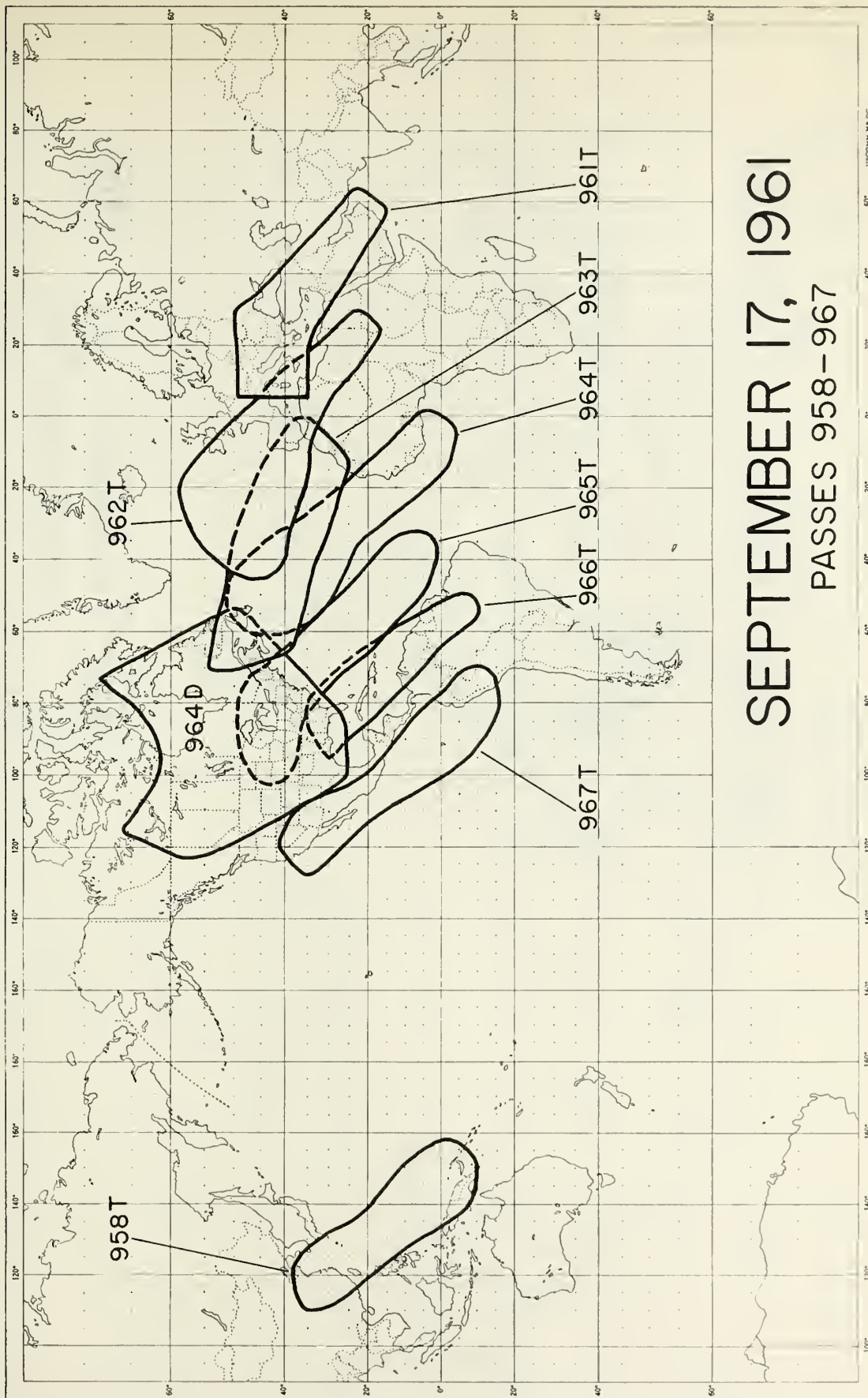






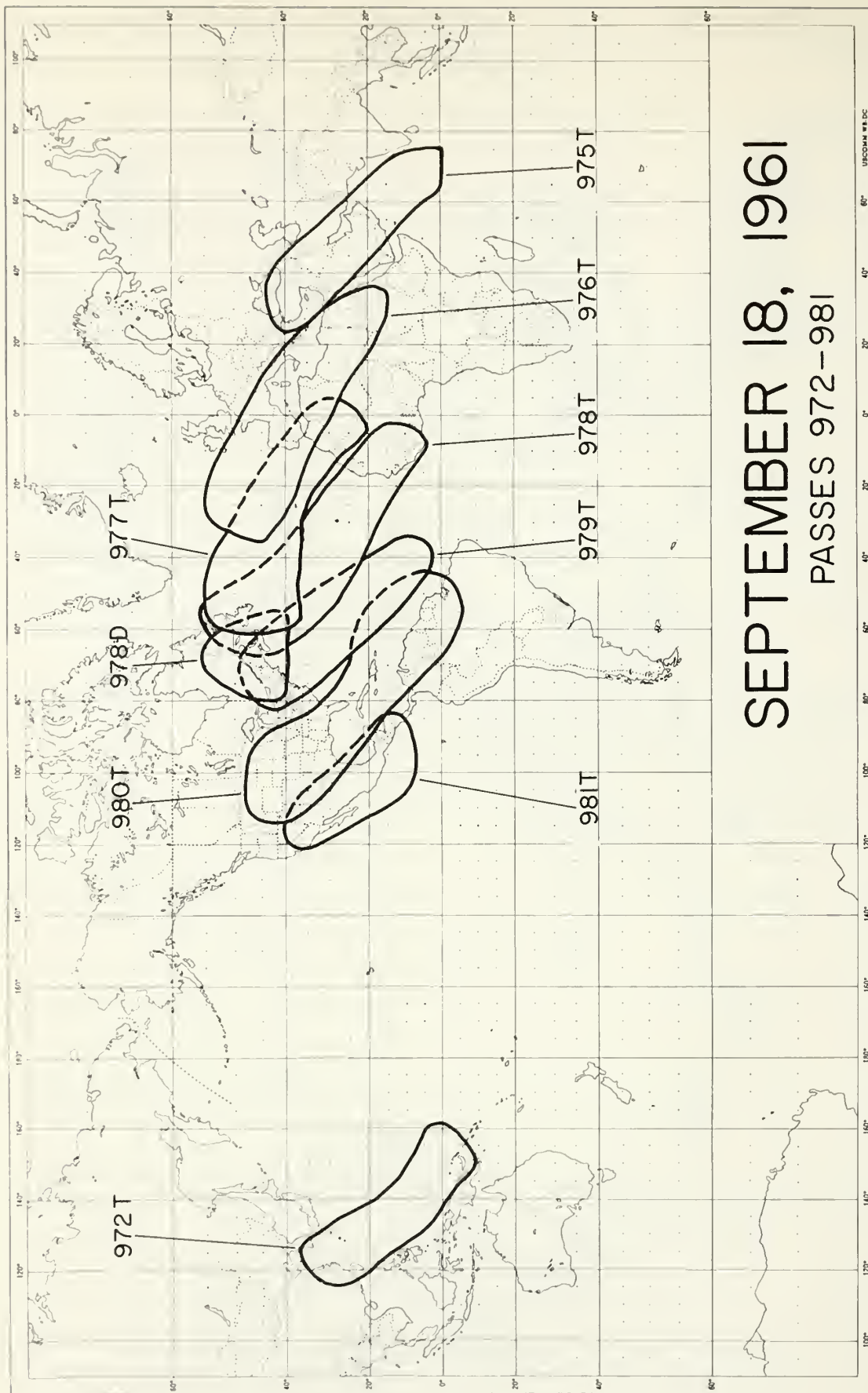


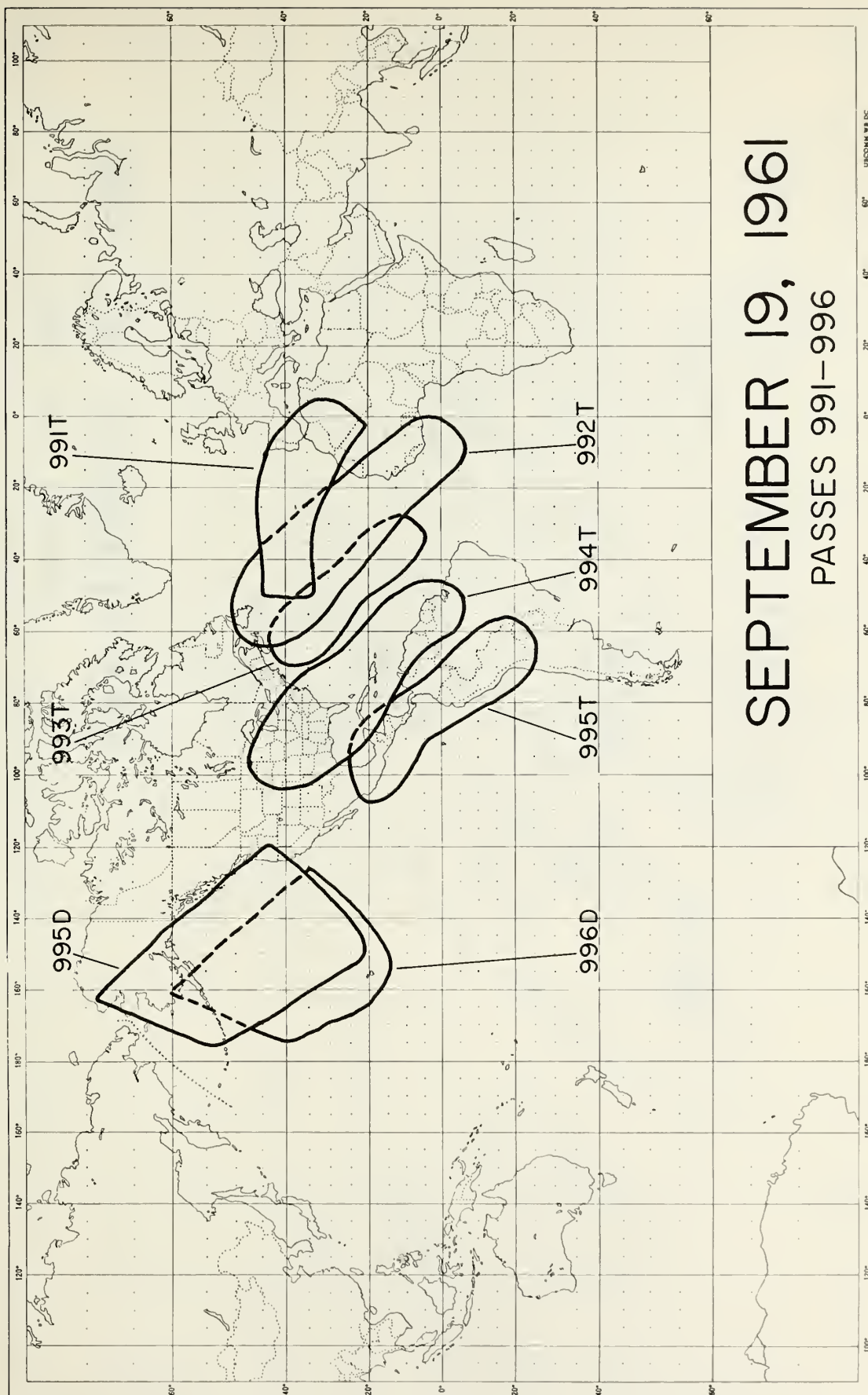




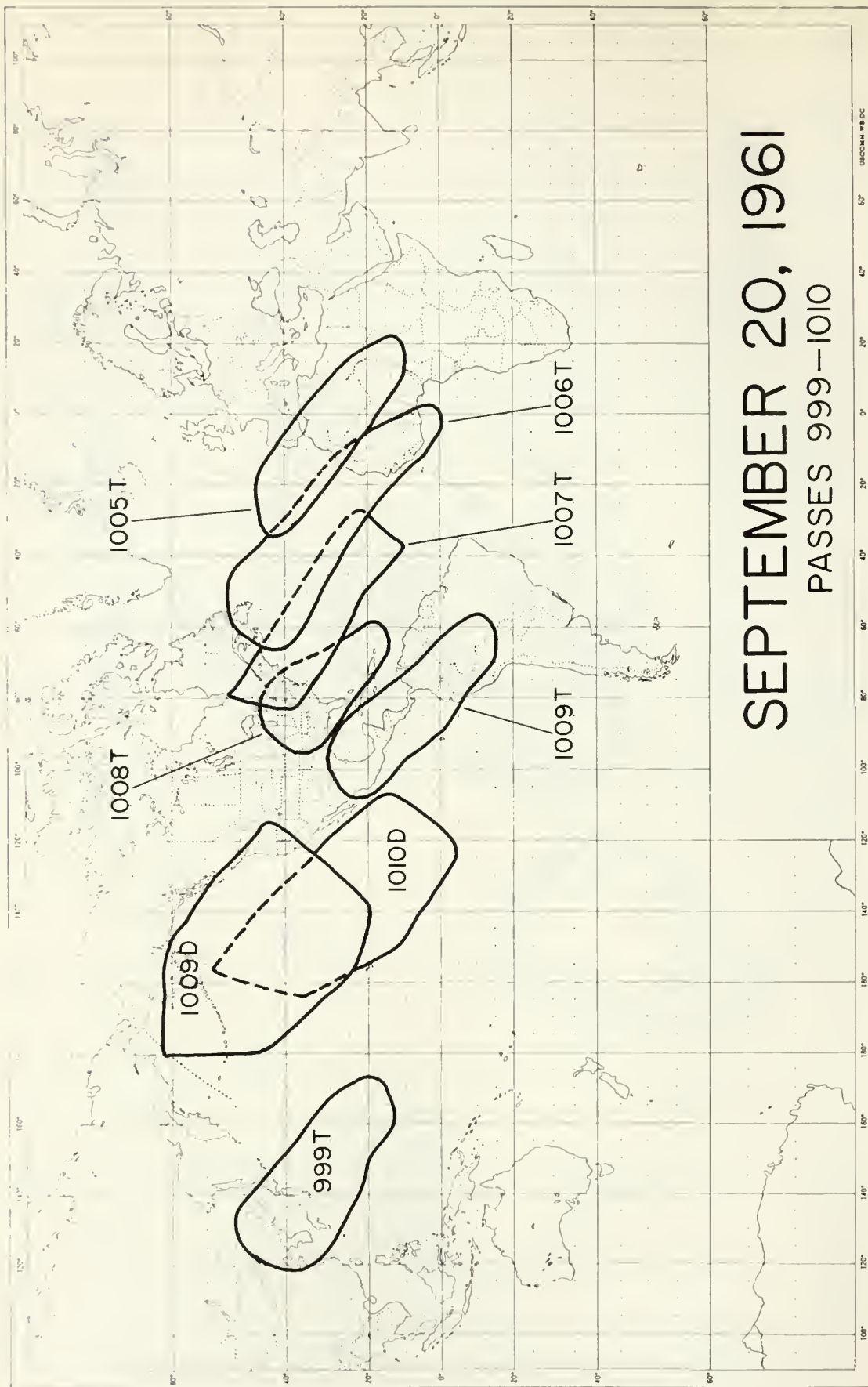
SEPTEMBER 17, 1961  
 PASSES 958-967

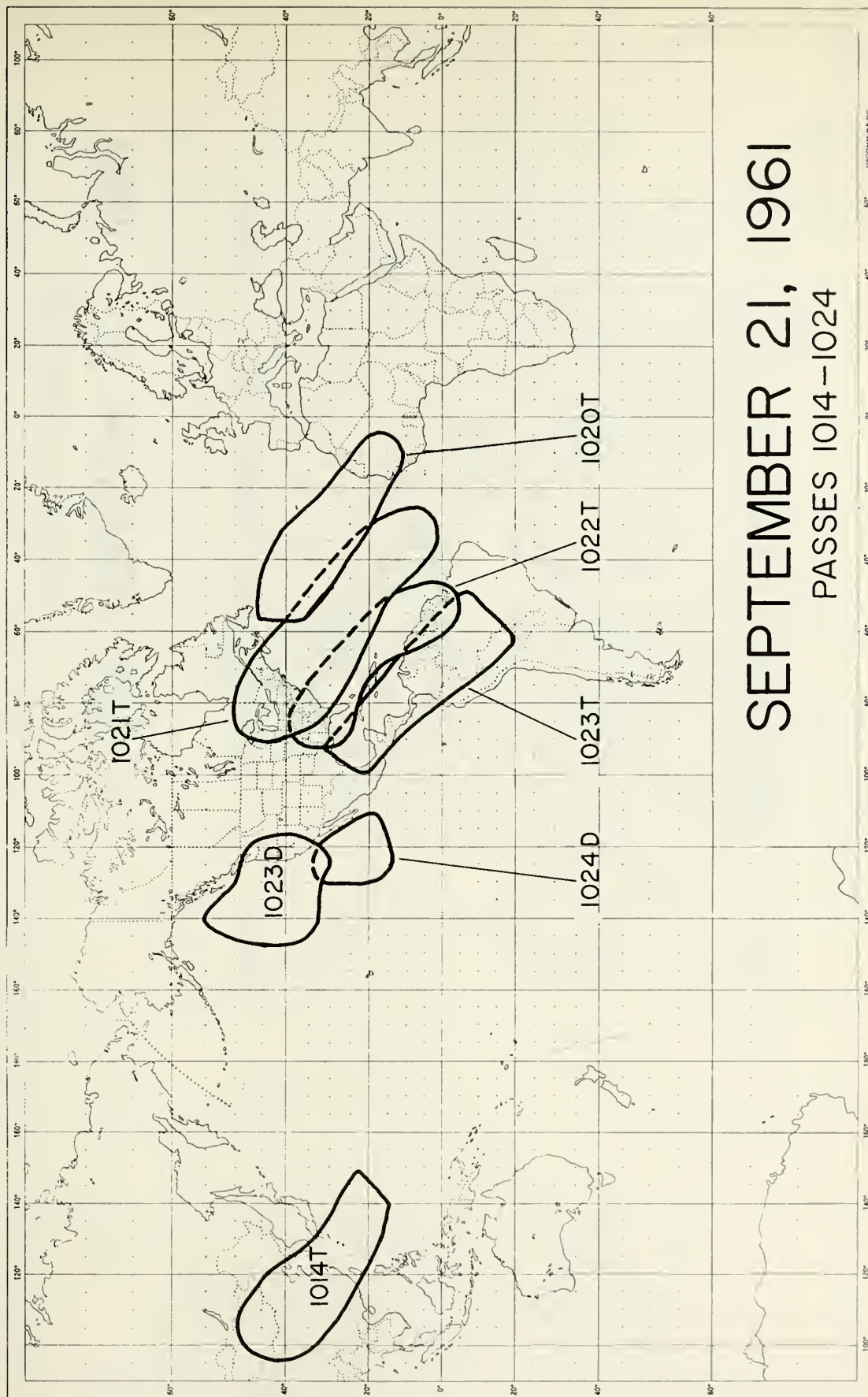
USCNAV 94 DC





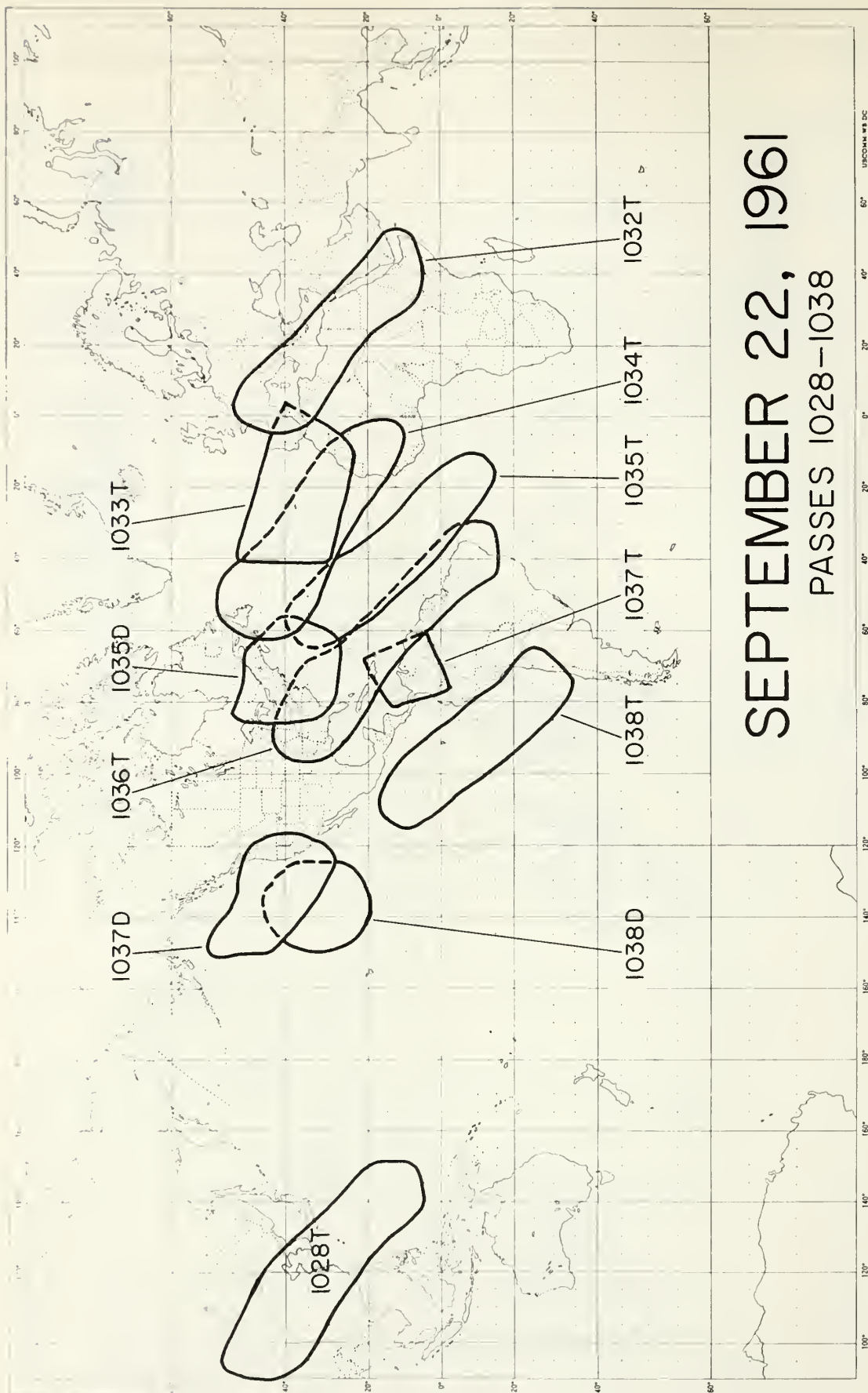






SEPTEMBER 21, 1961  
PASSES 1014-1024

USCOM 88 DC

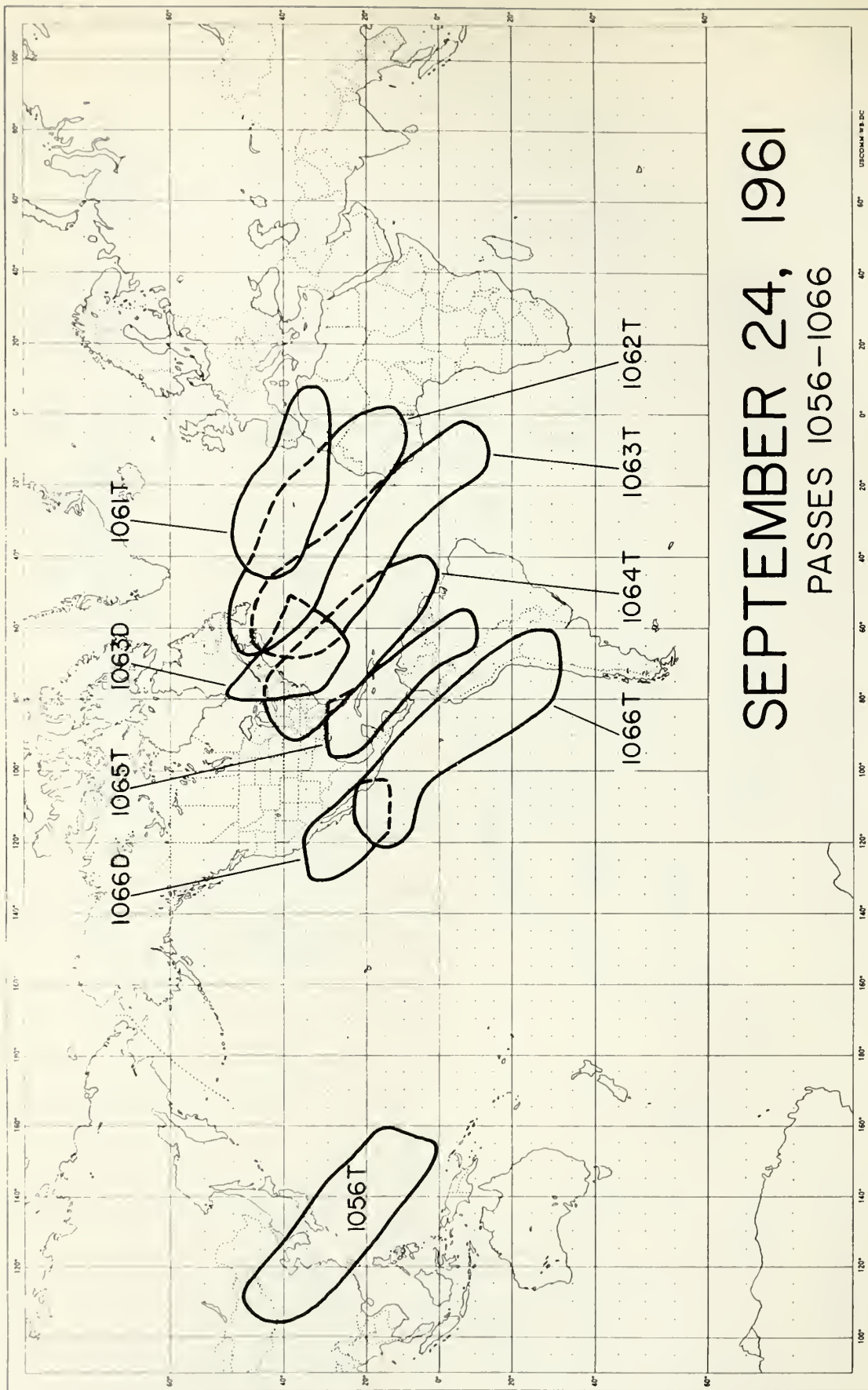


# SEPTEMBER 22, 1961

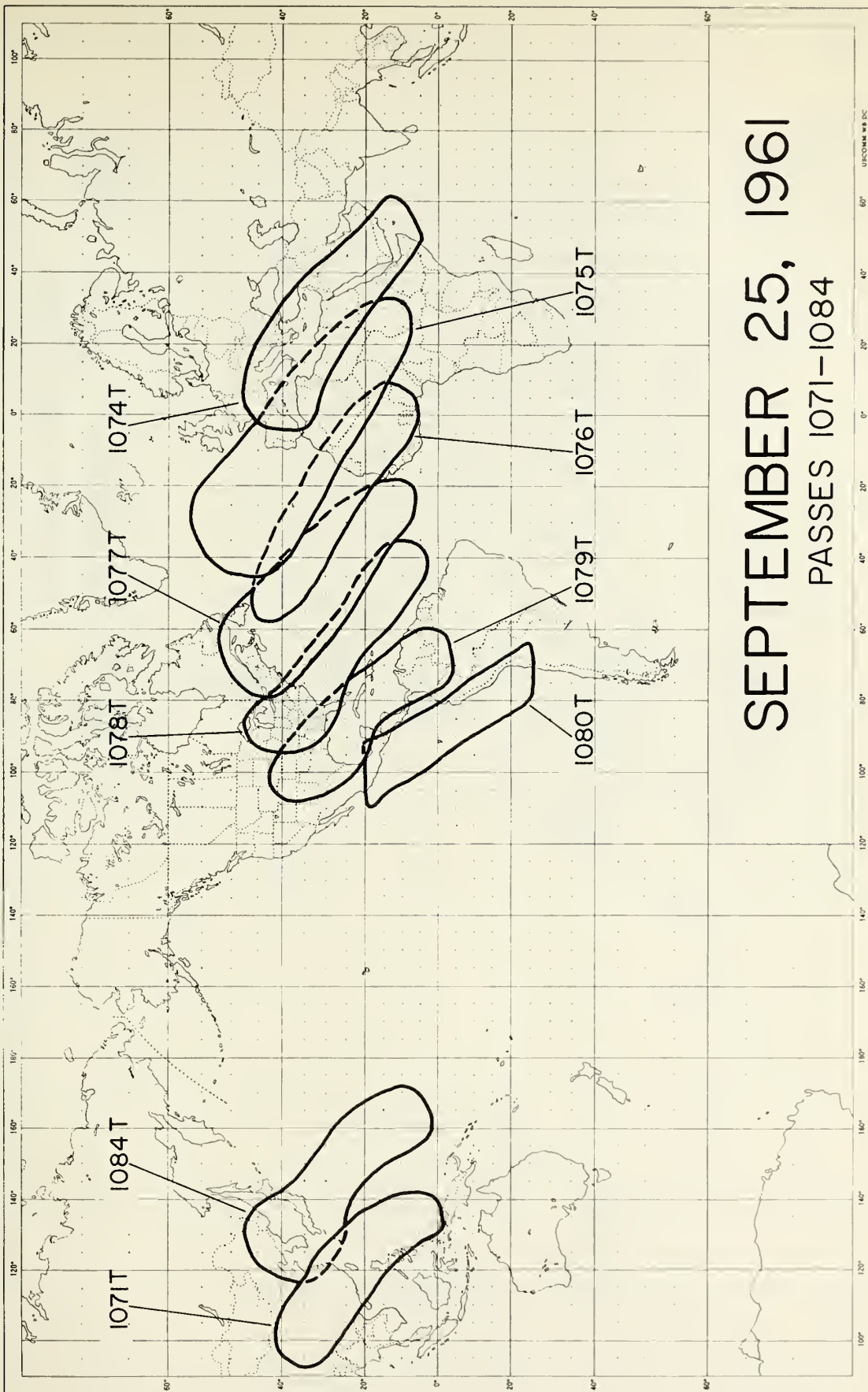
## PASSES 1028-1038





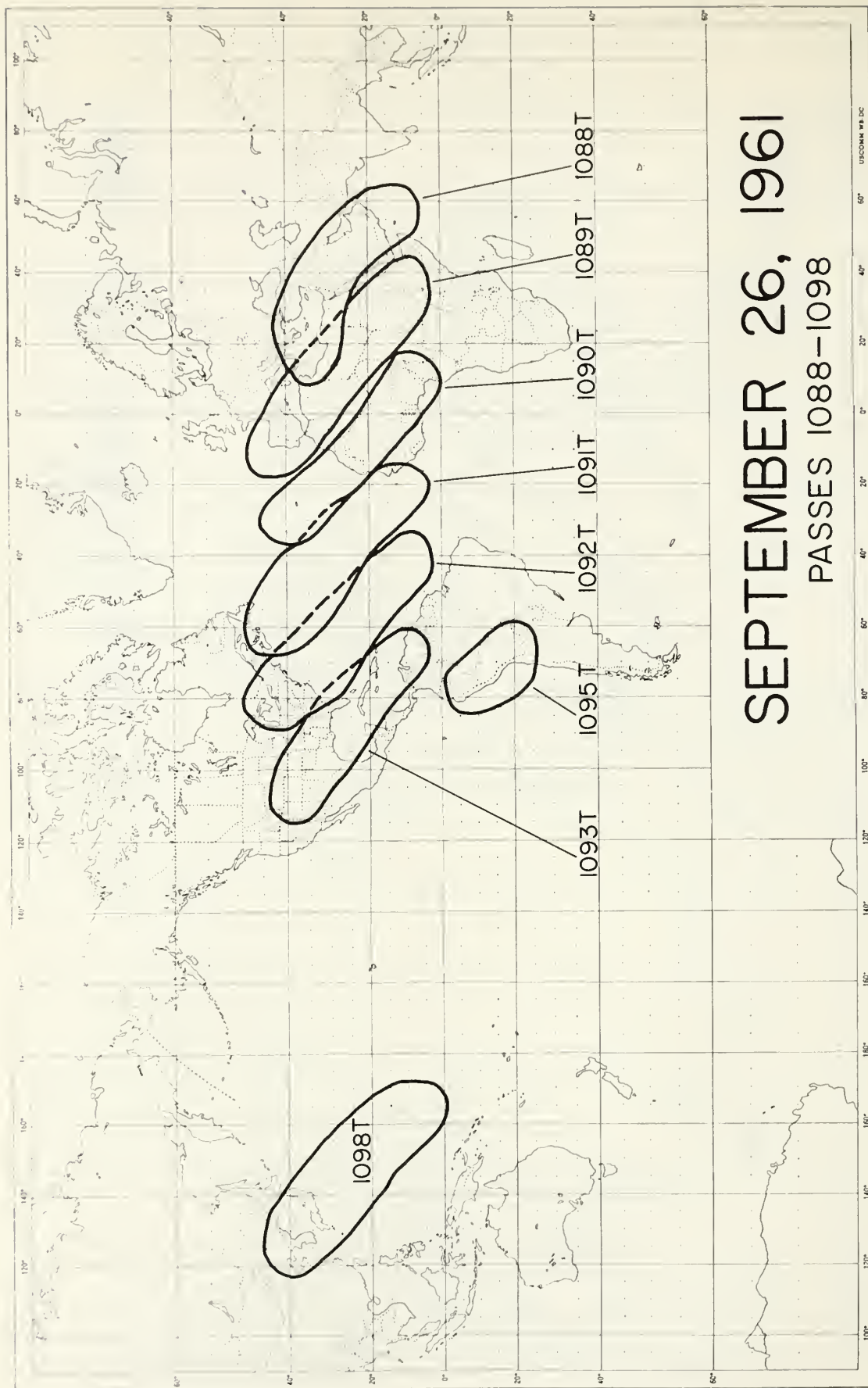


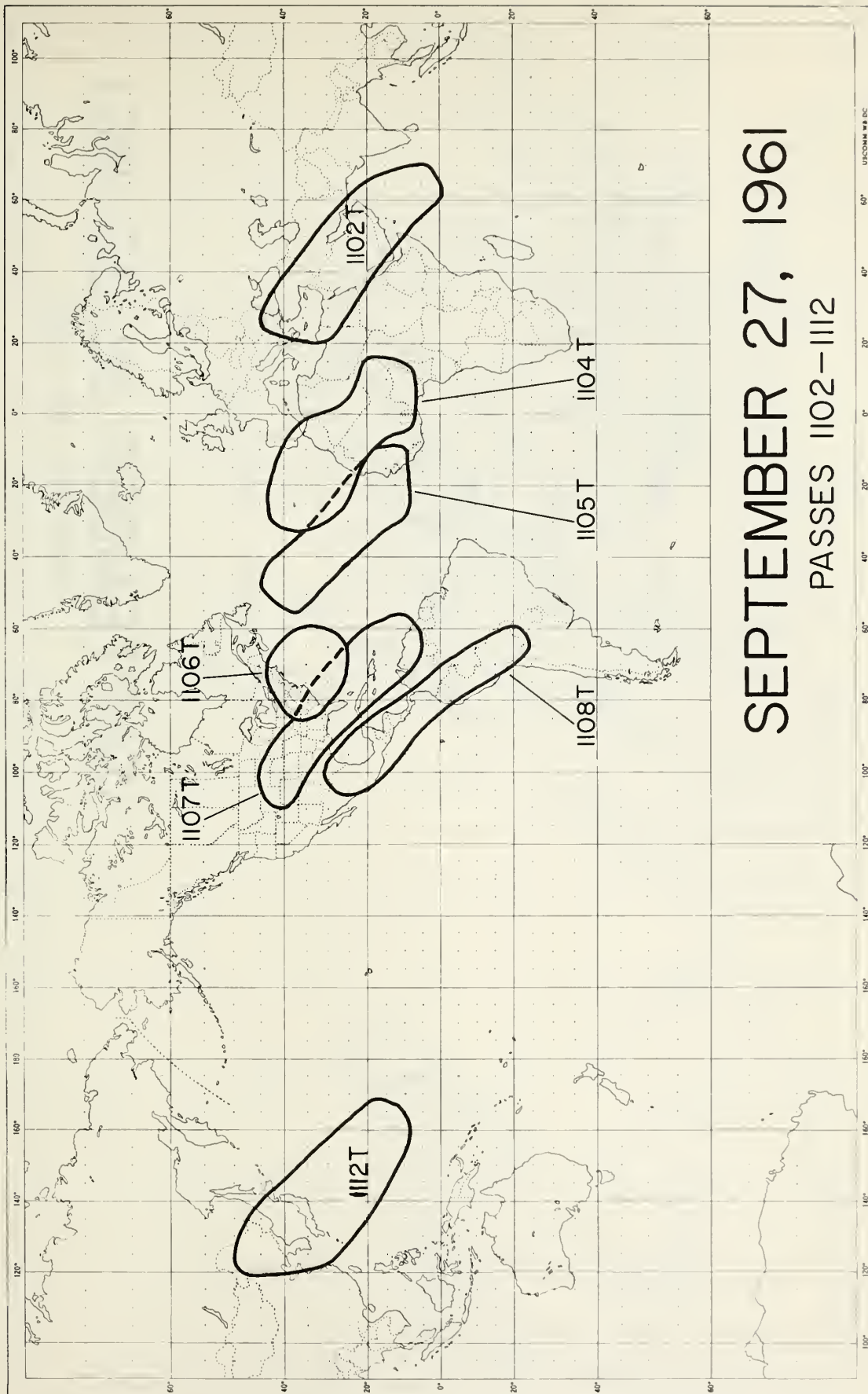
SEPTEMBER 24, 1961  
PASSES 1056-1066

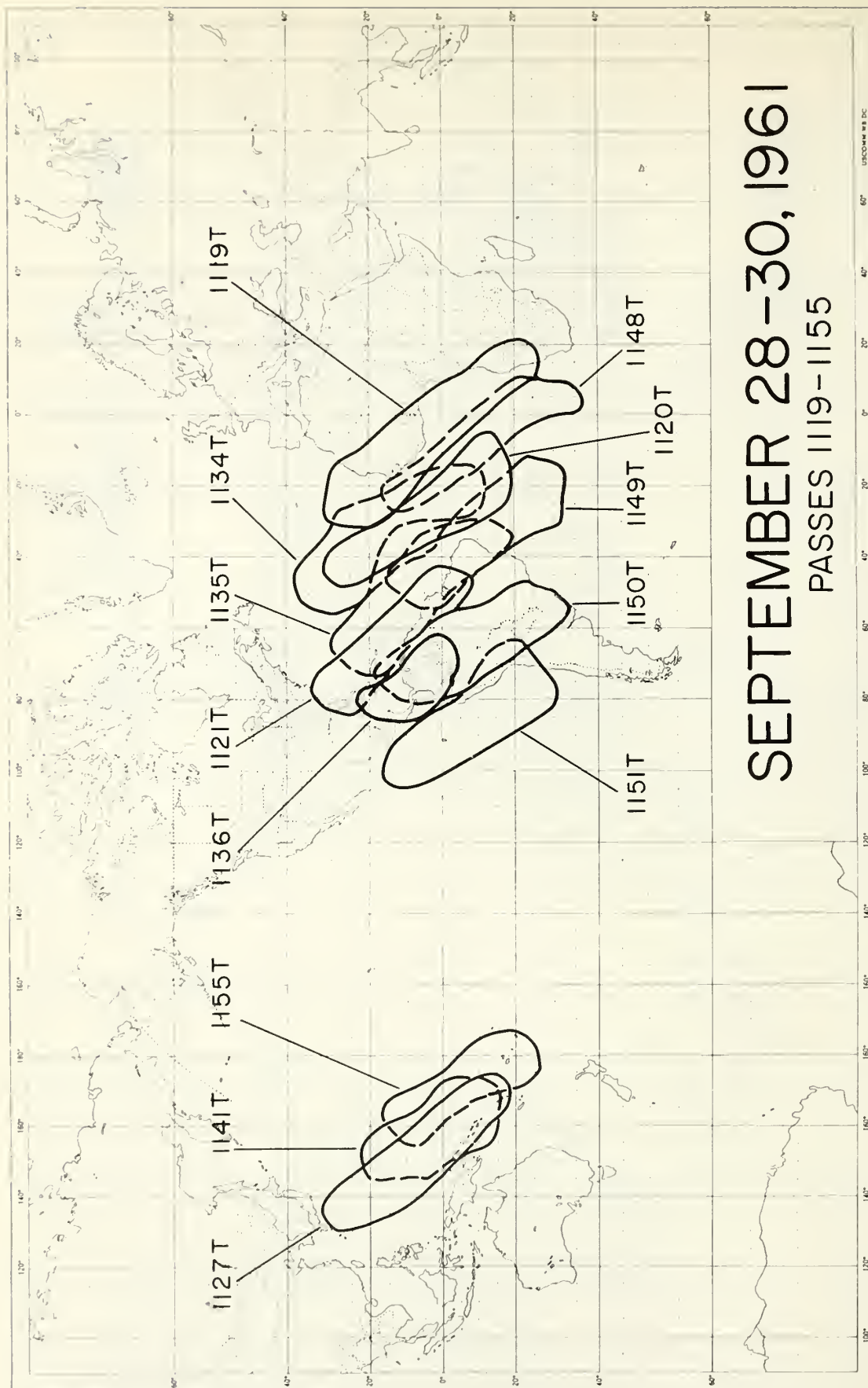


SEPTEMBER 25, 1961  
PASSES 1071-1084

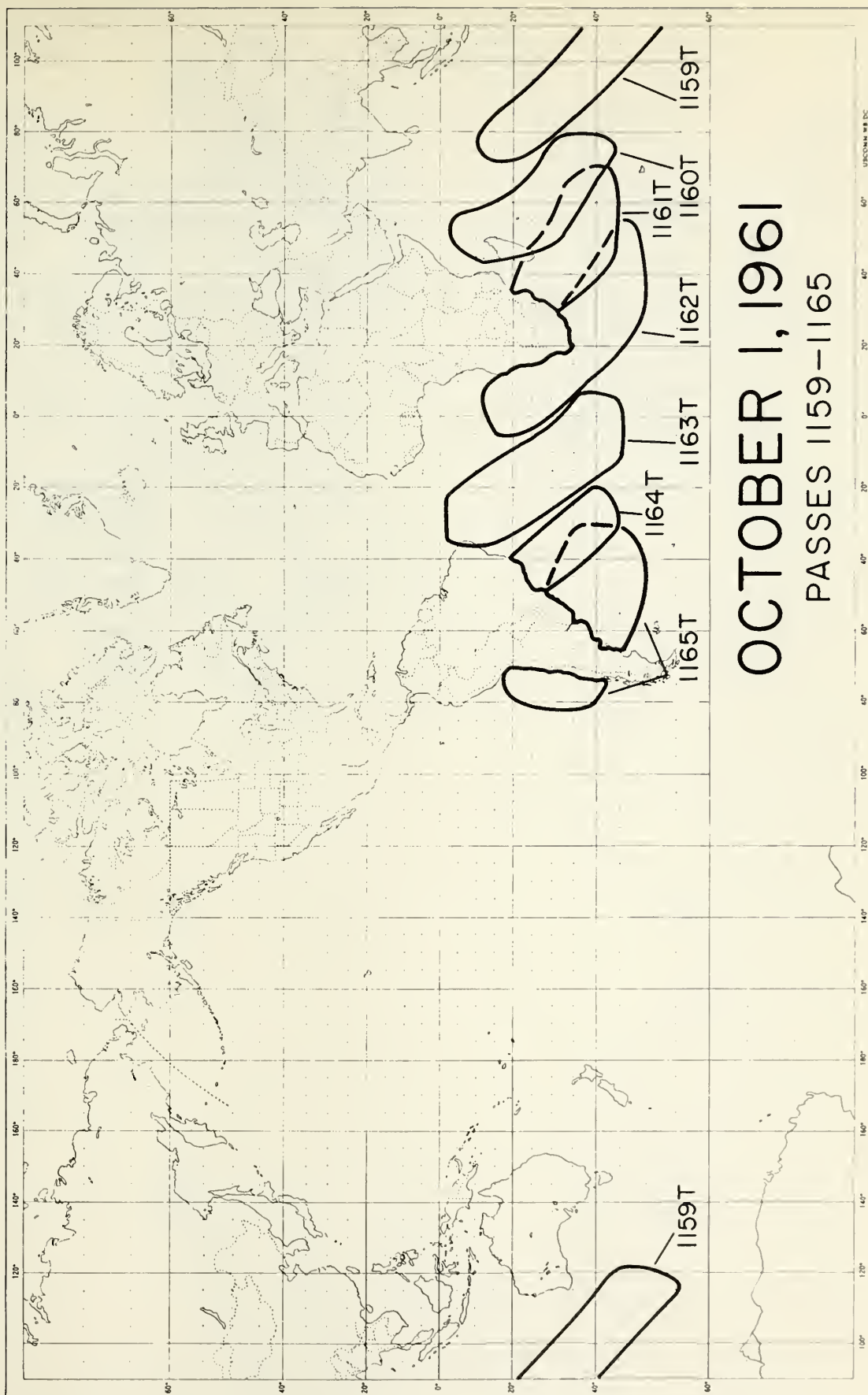


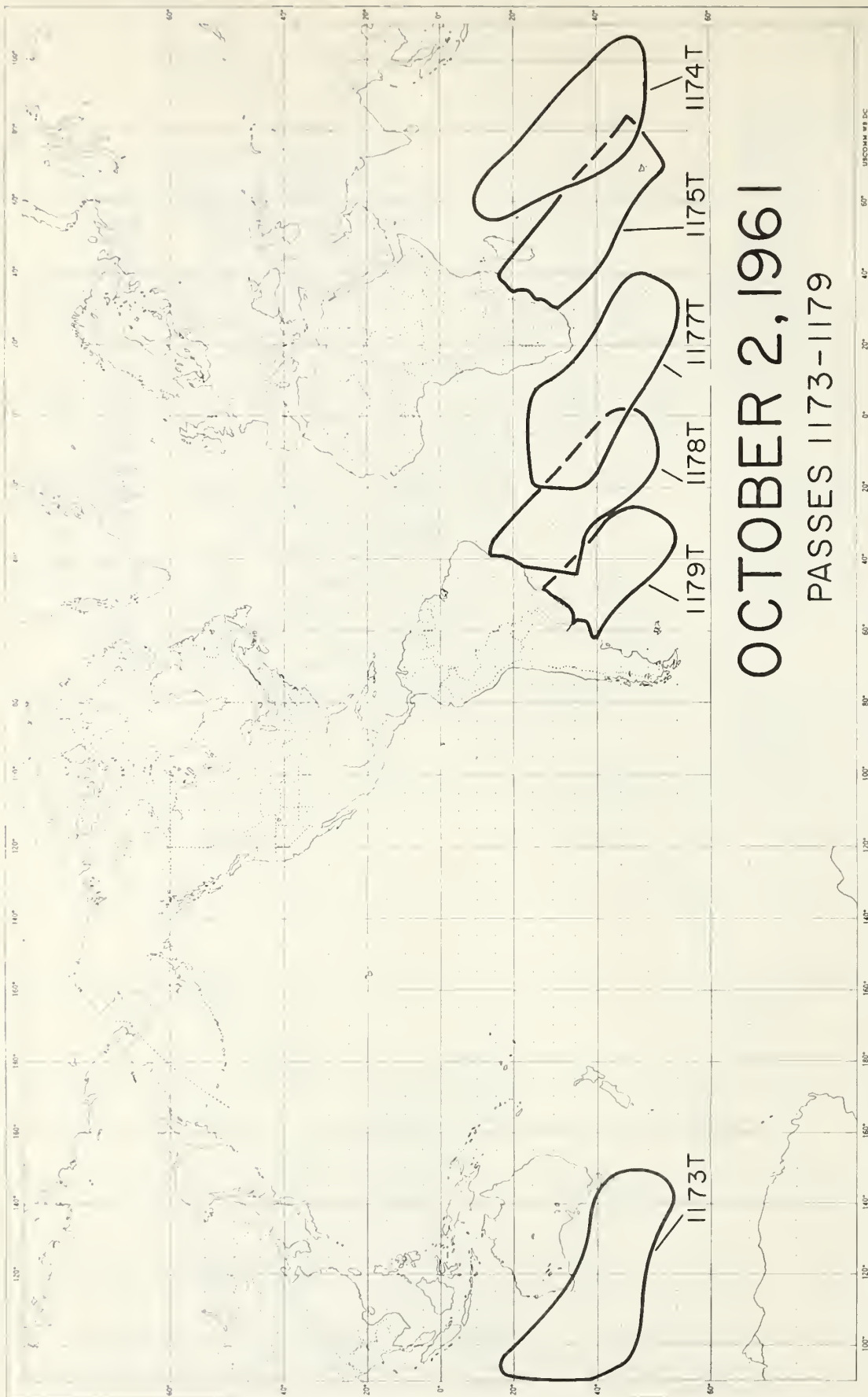


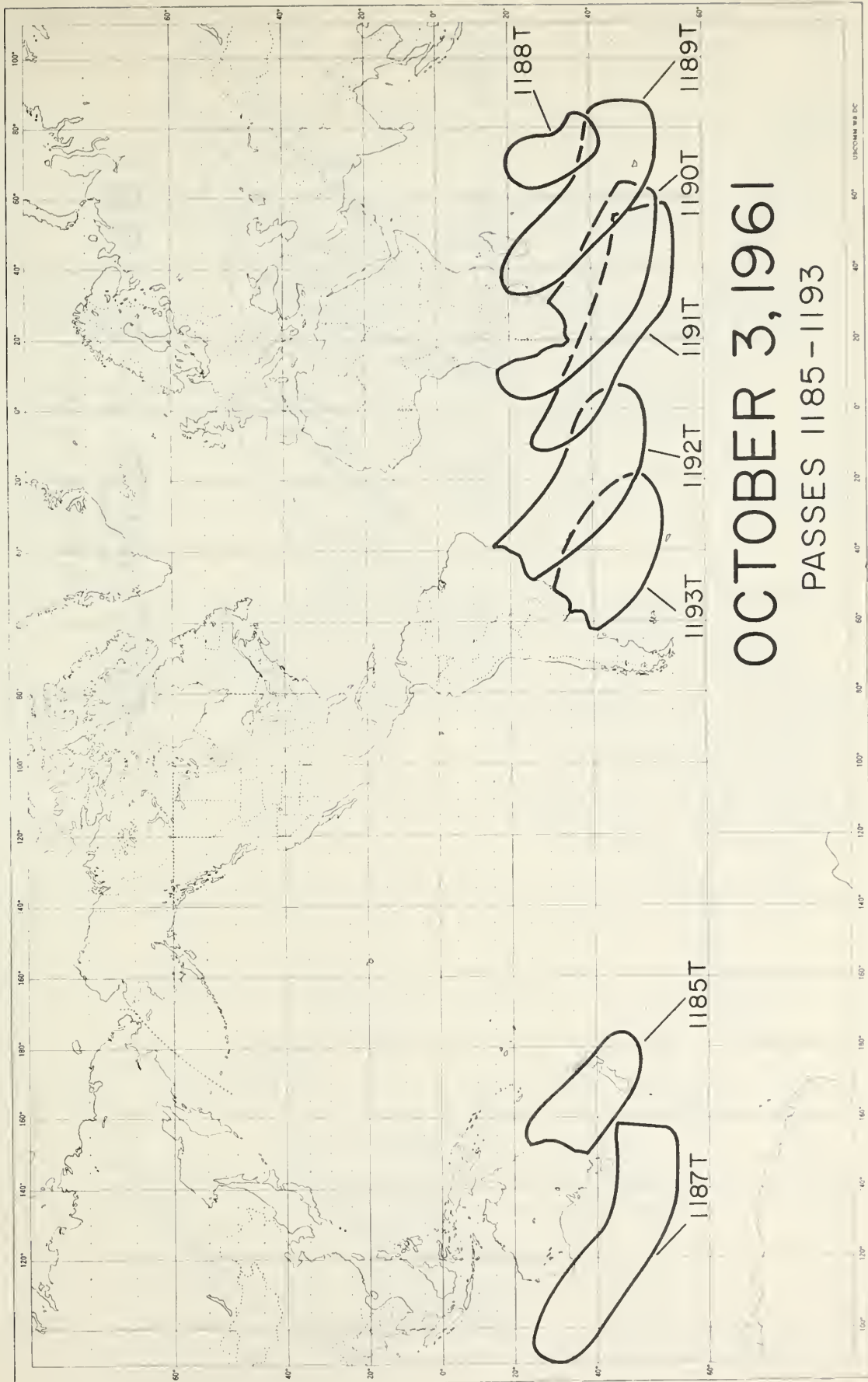




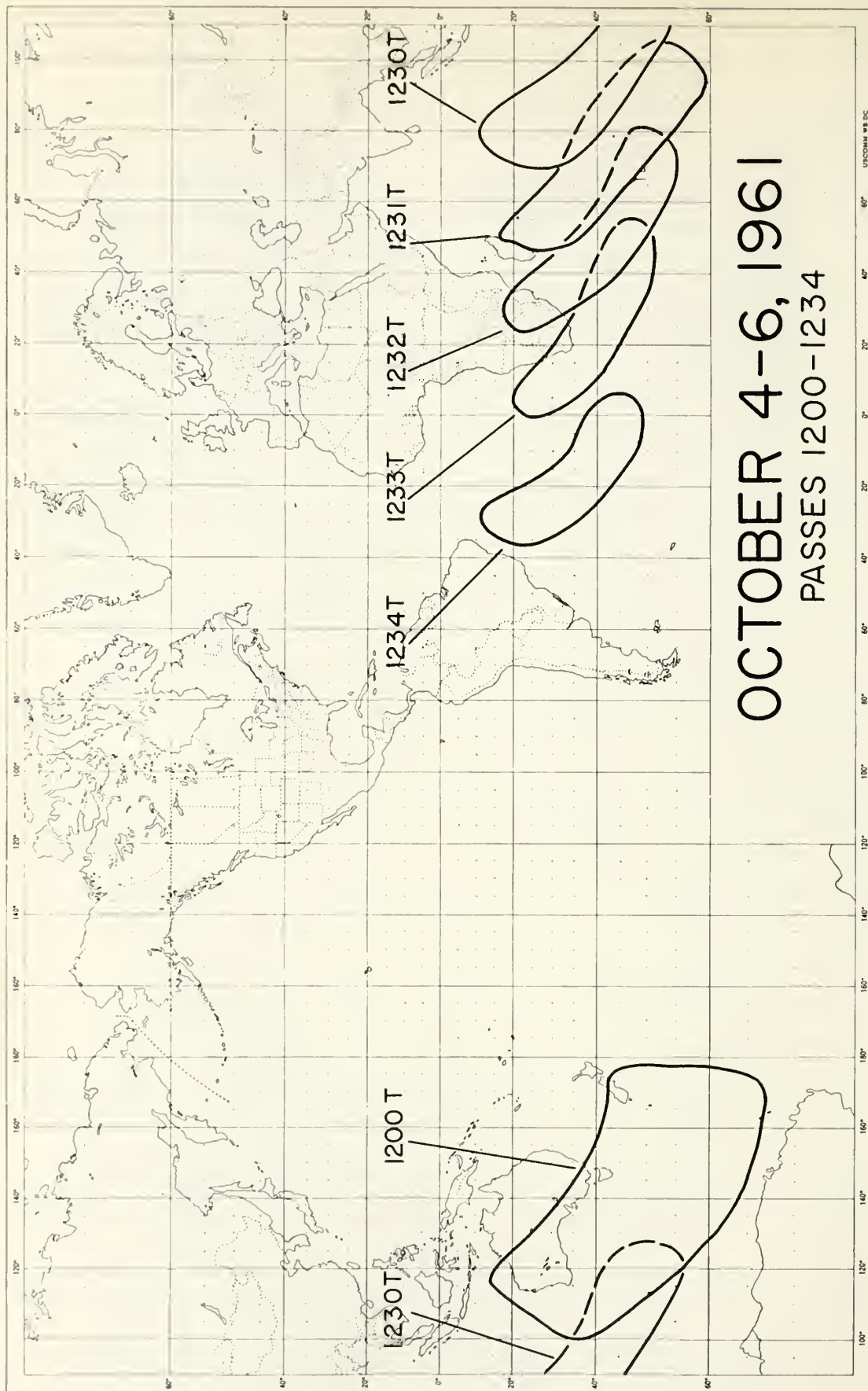


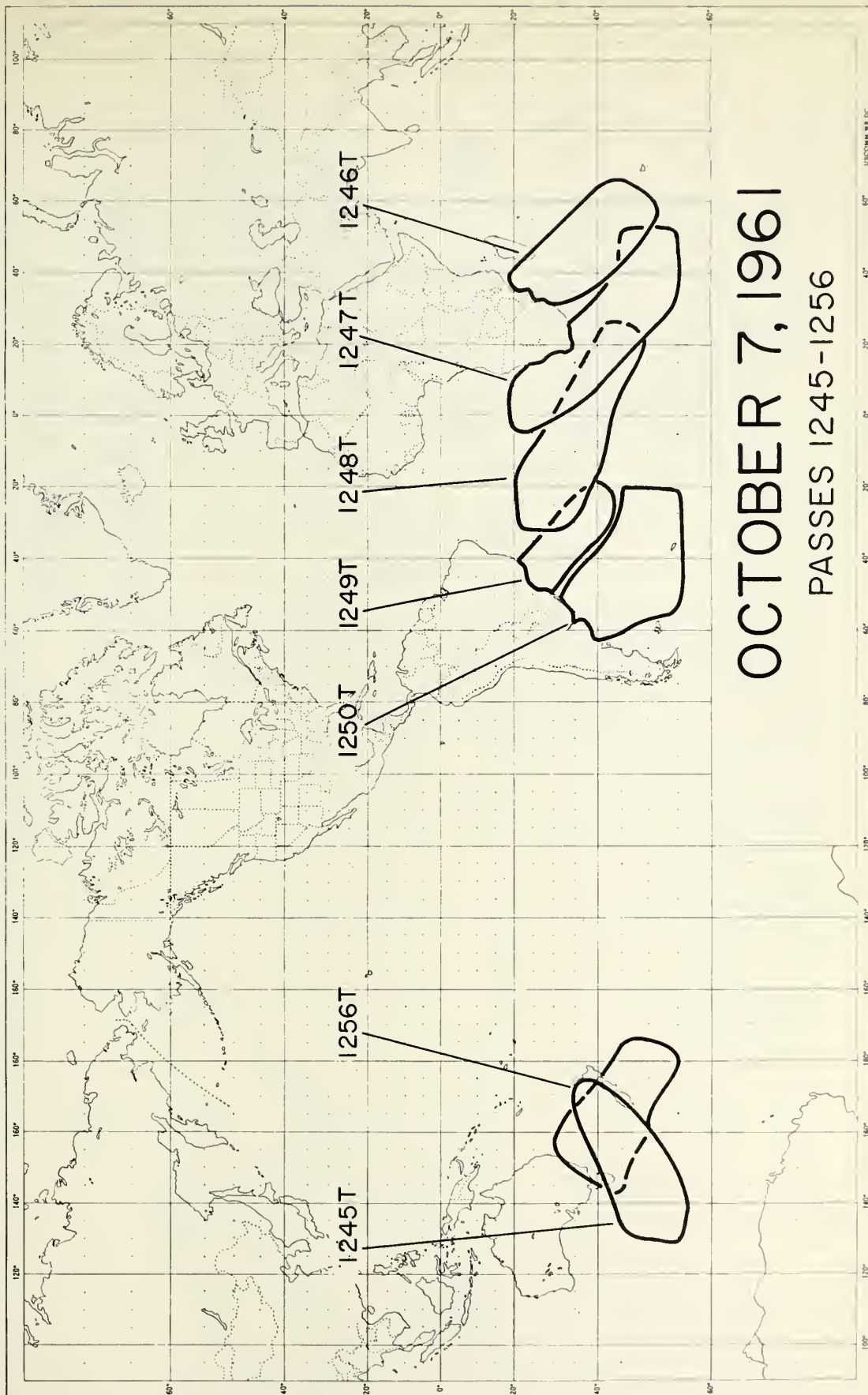


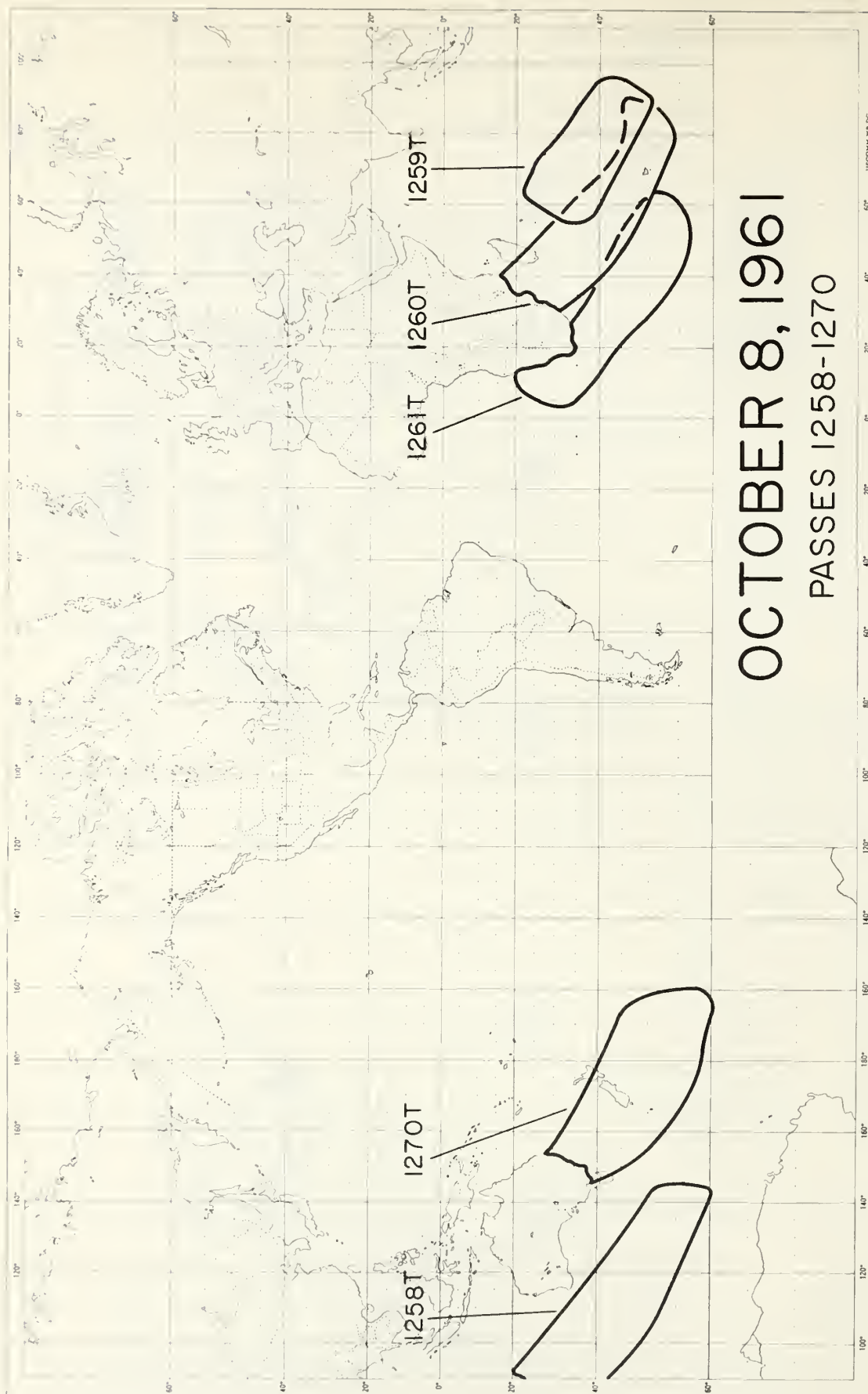




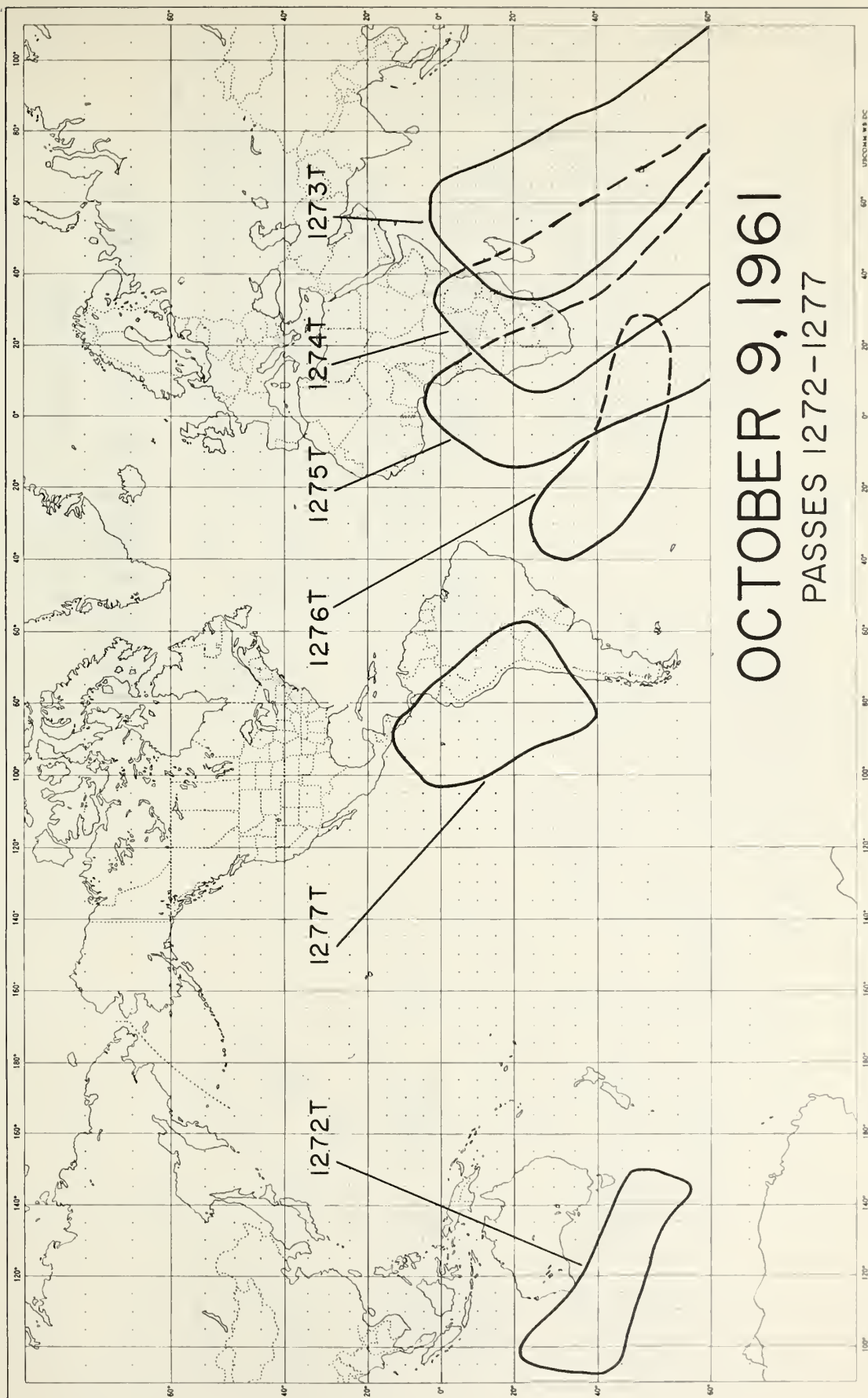


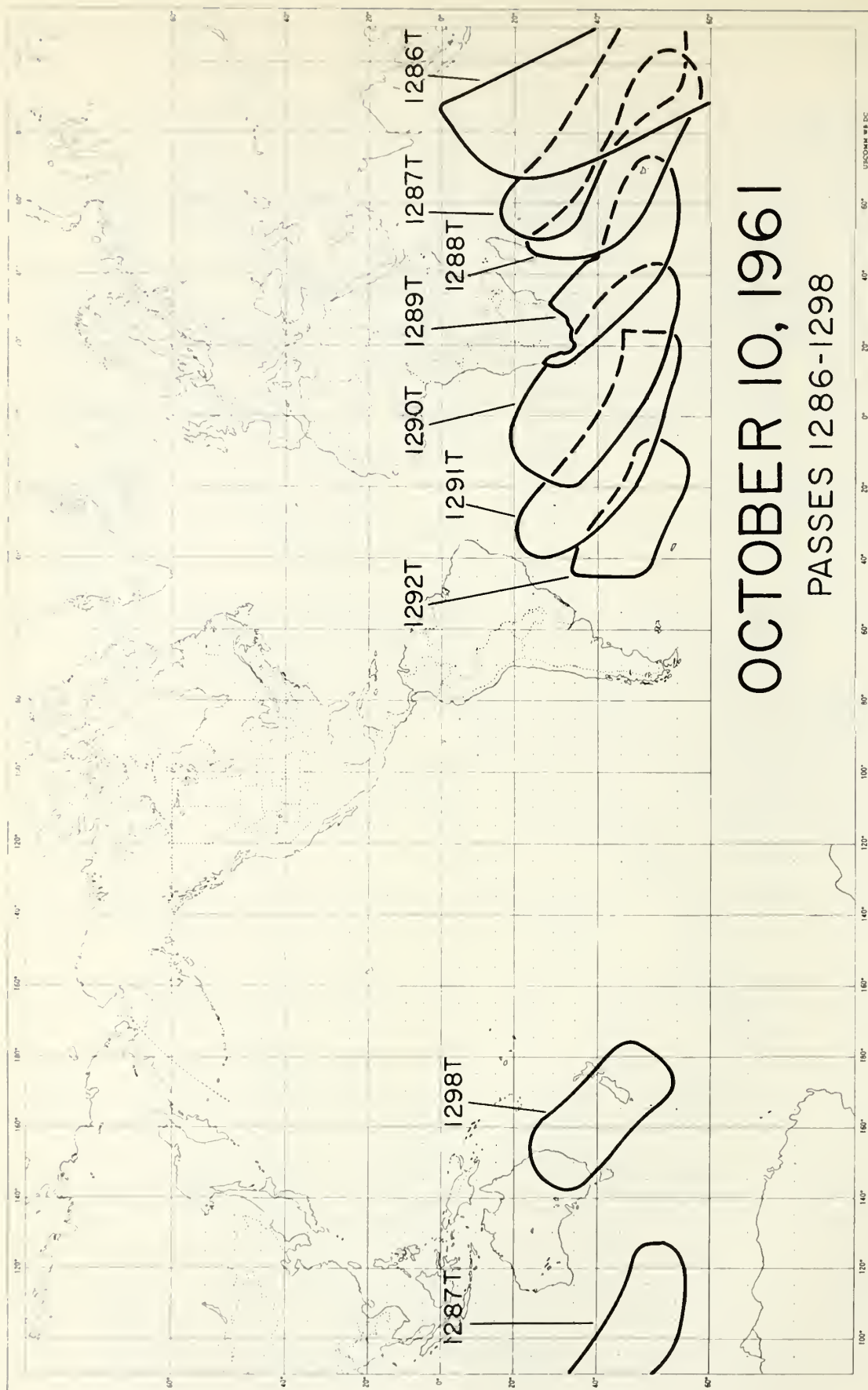






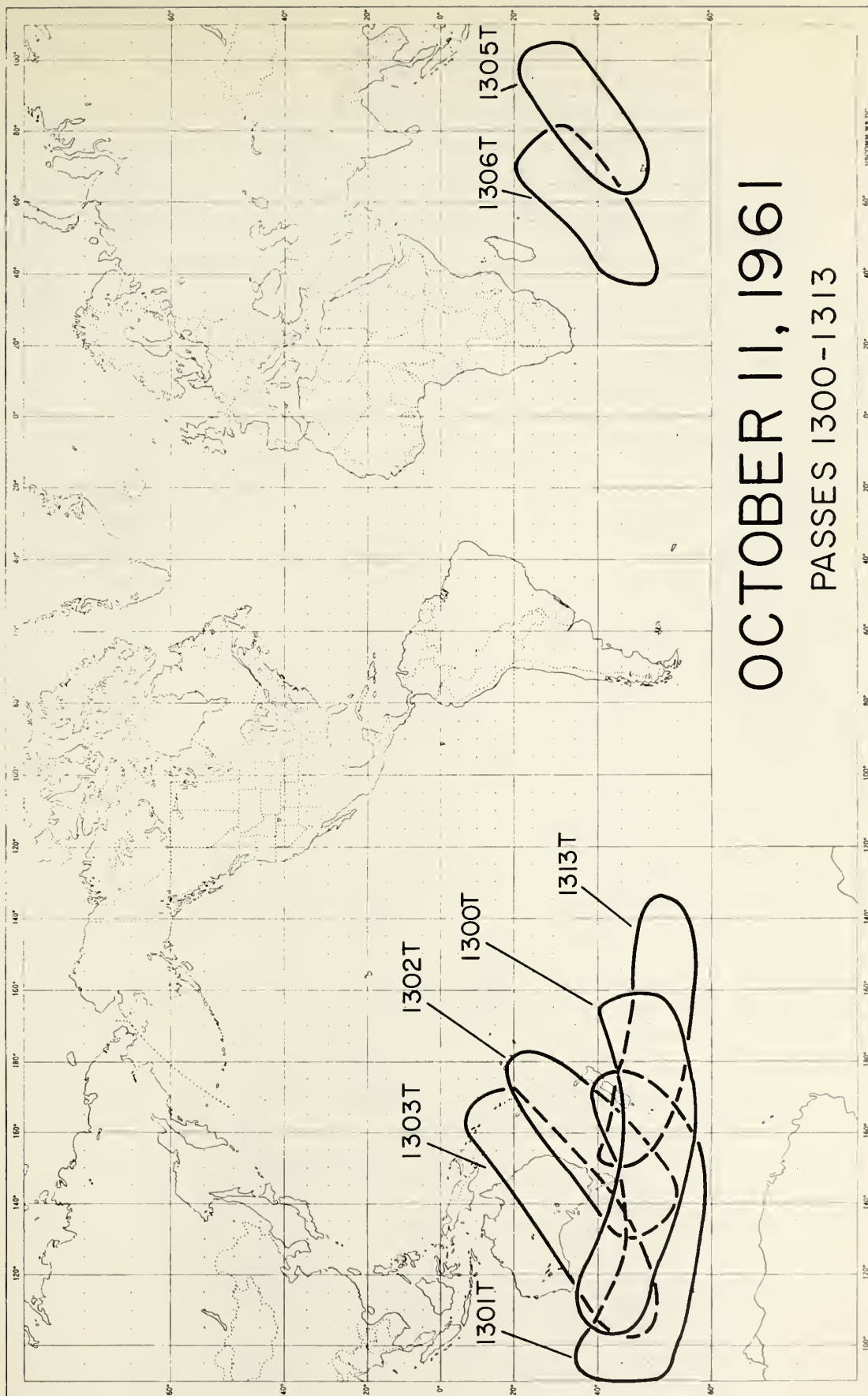




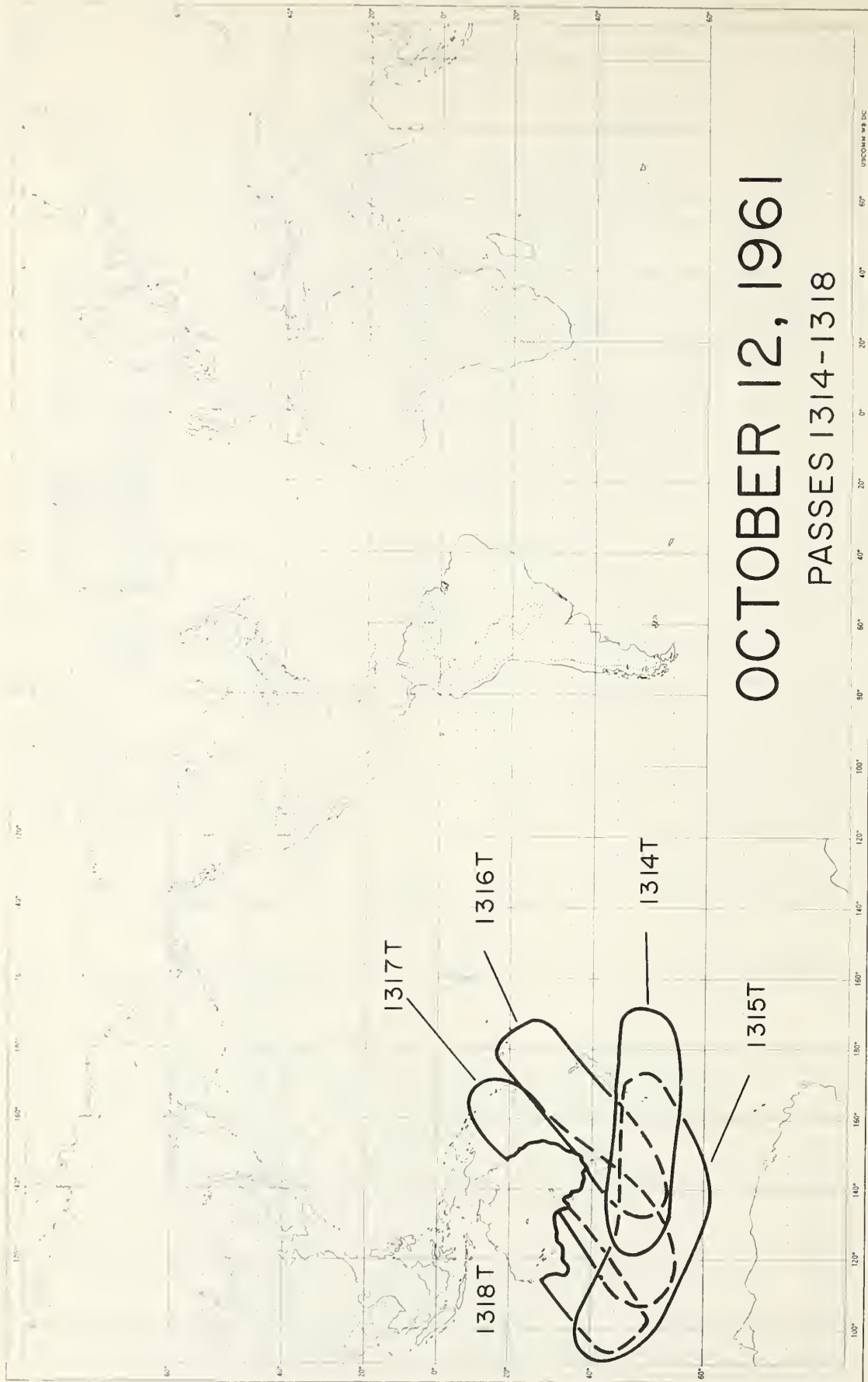


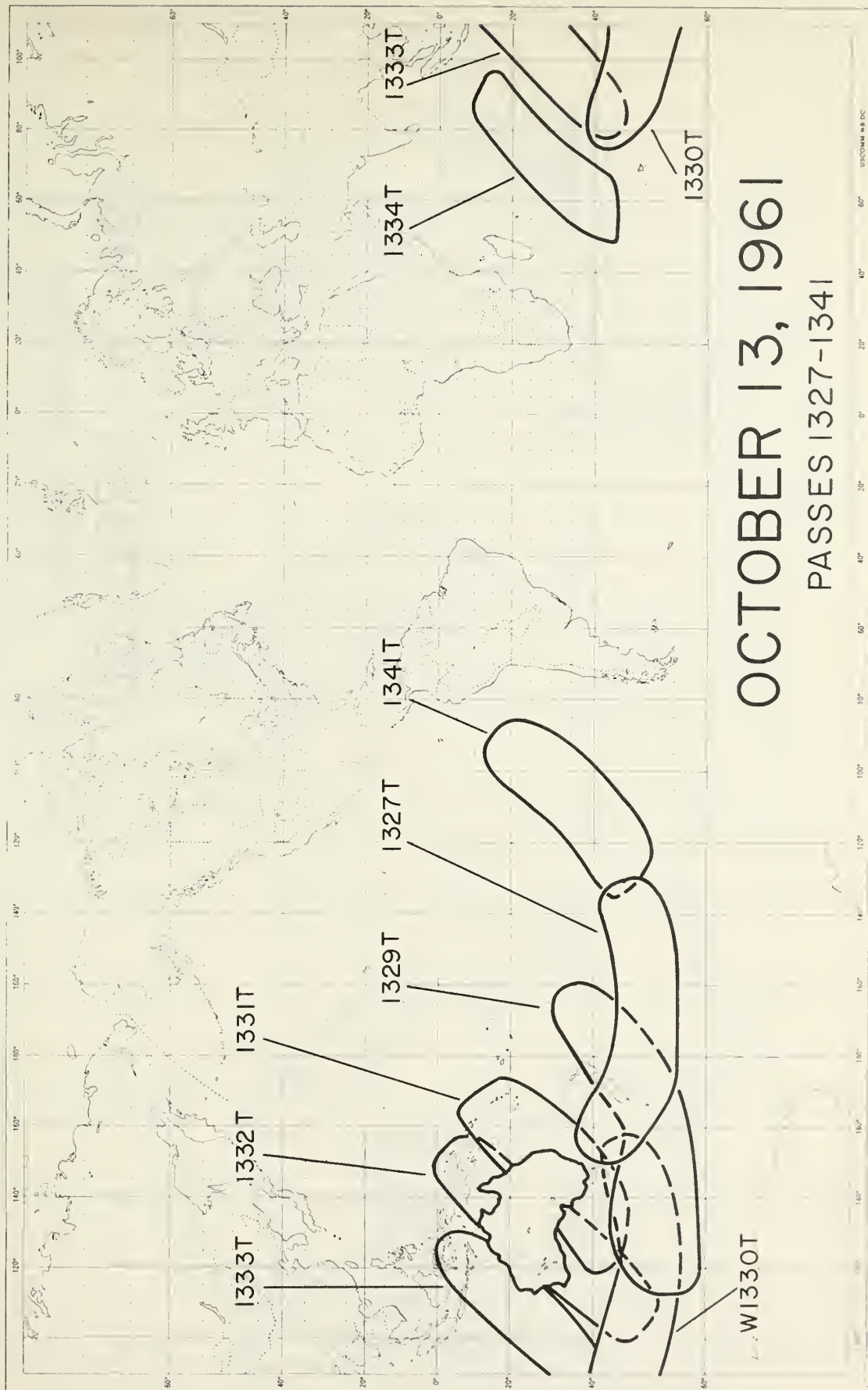
OCTOBER 10, 1961  
PASSES 1286-1298

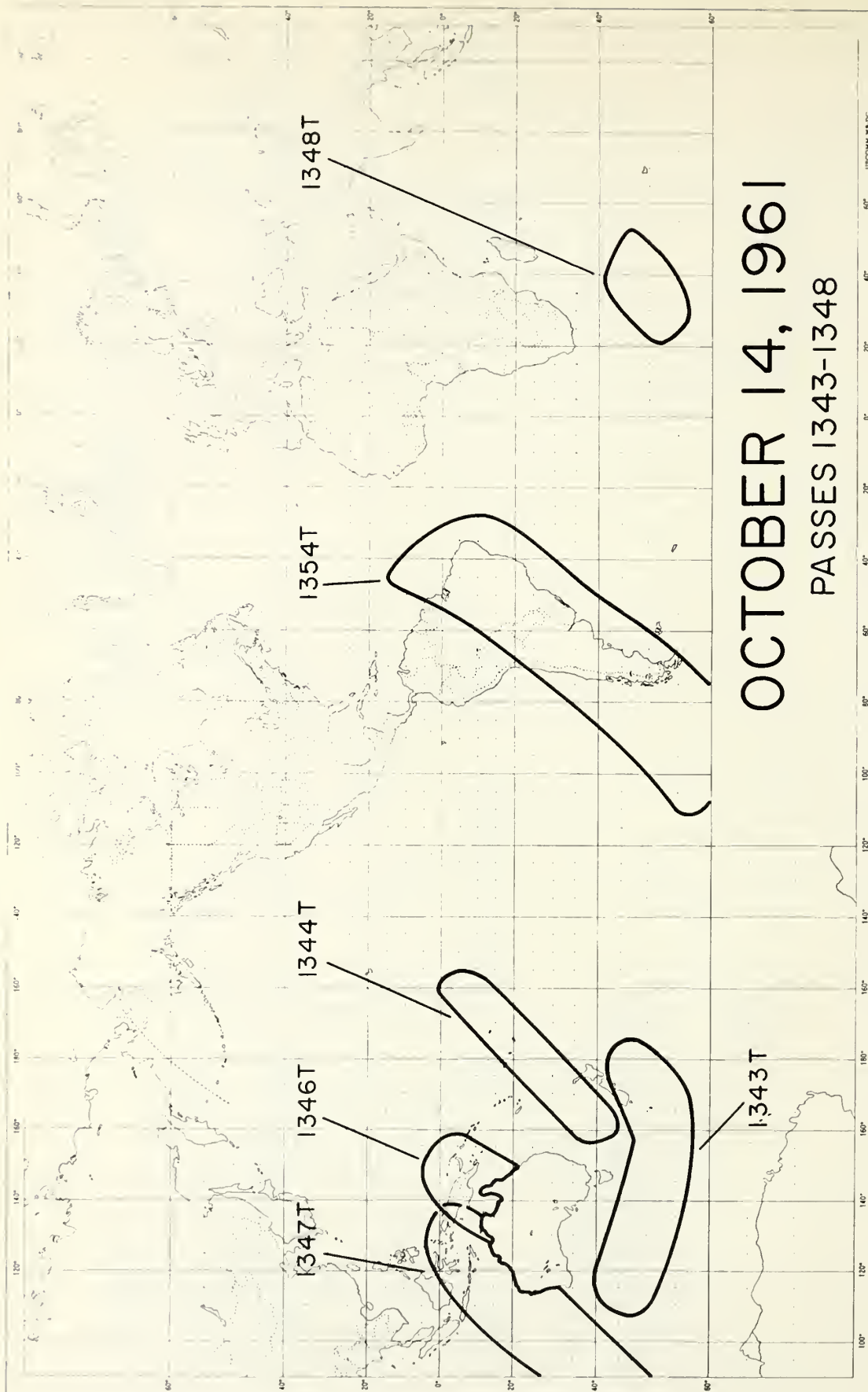
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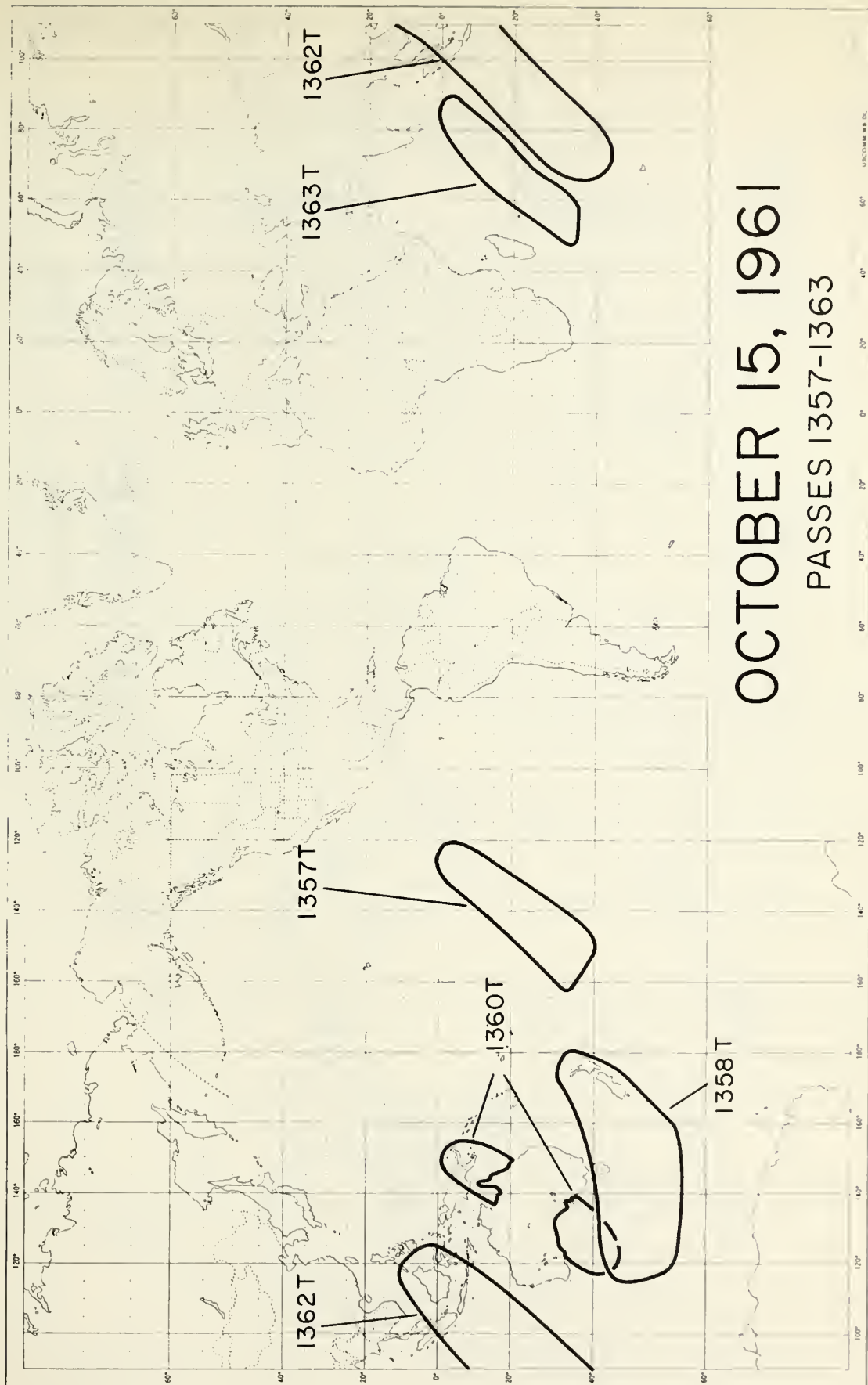


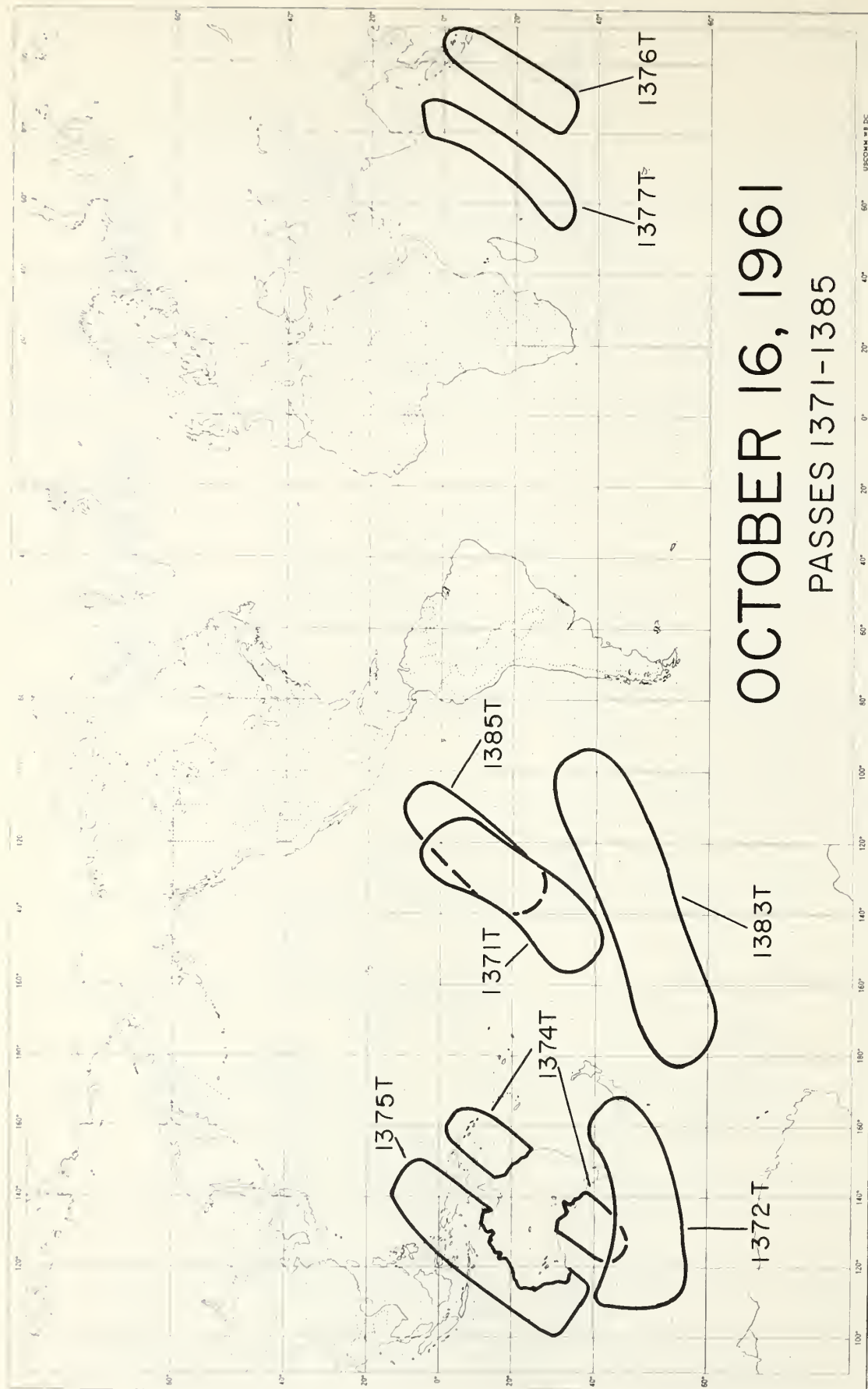


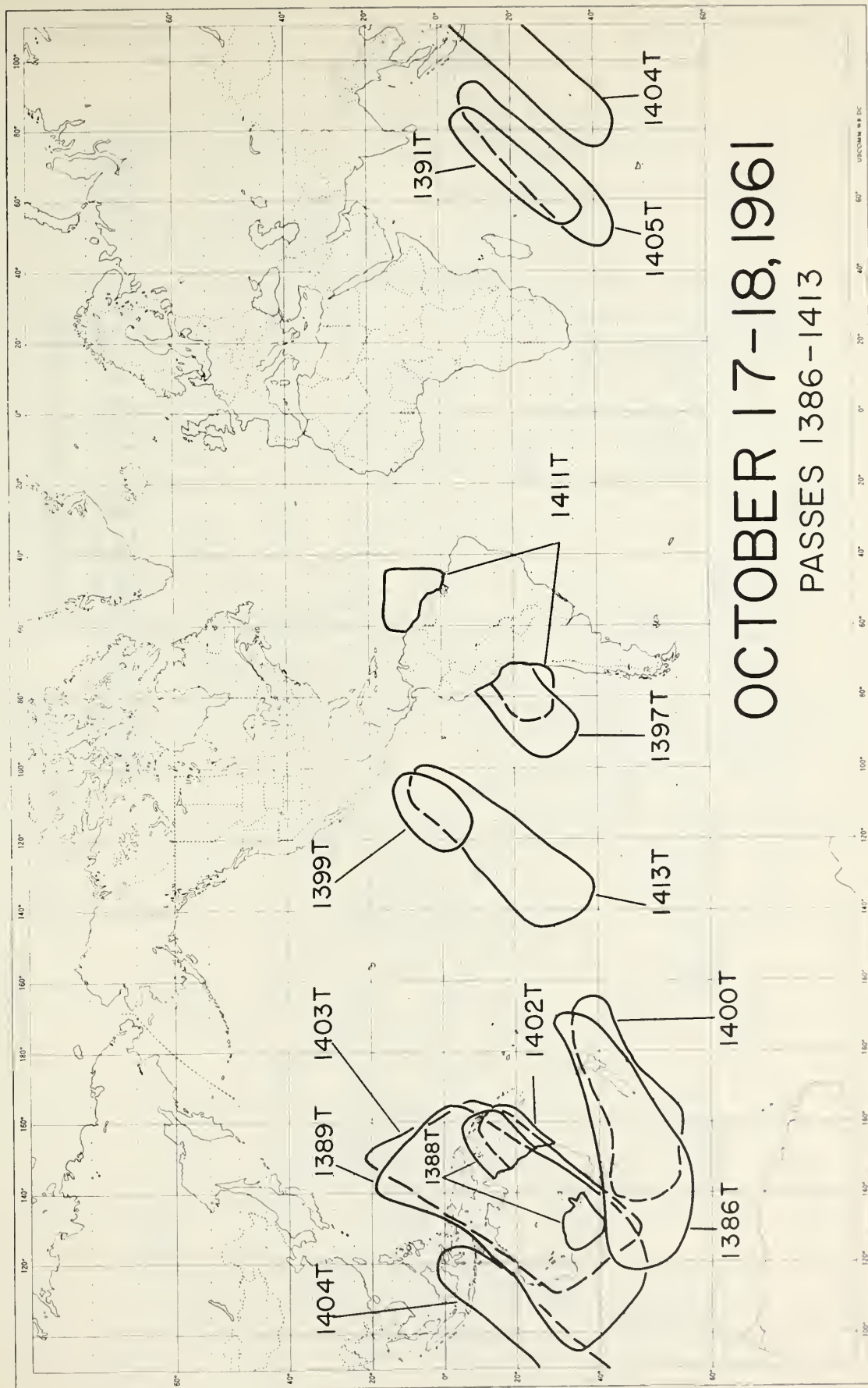




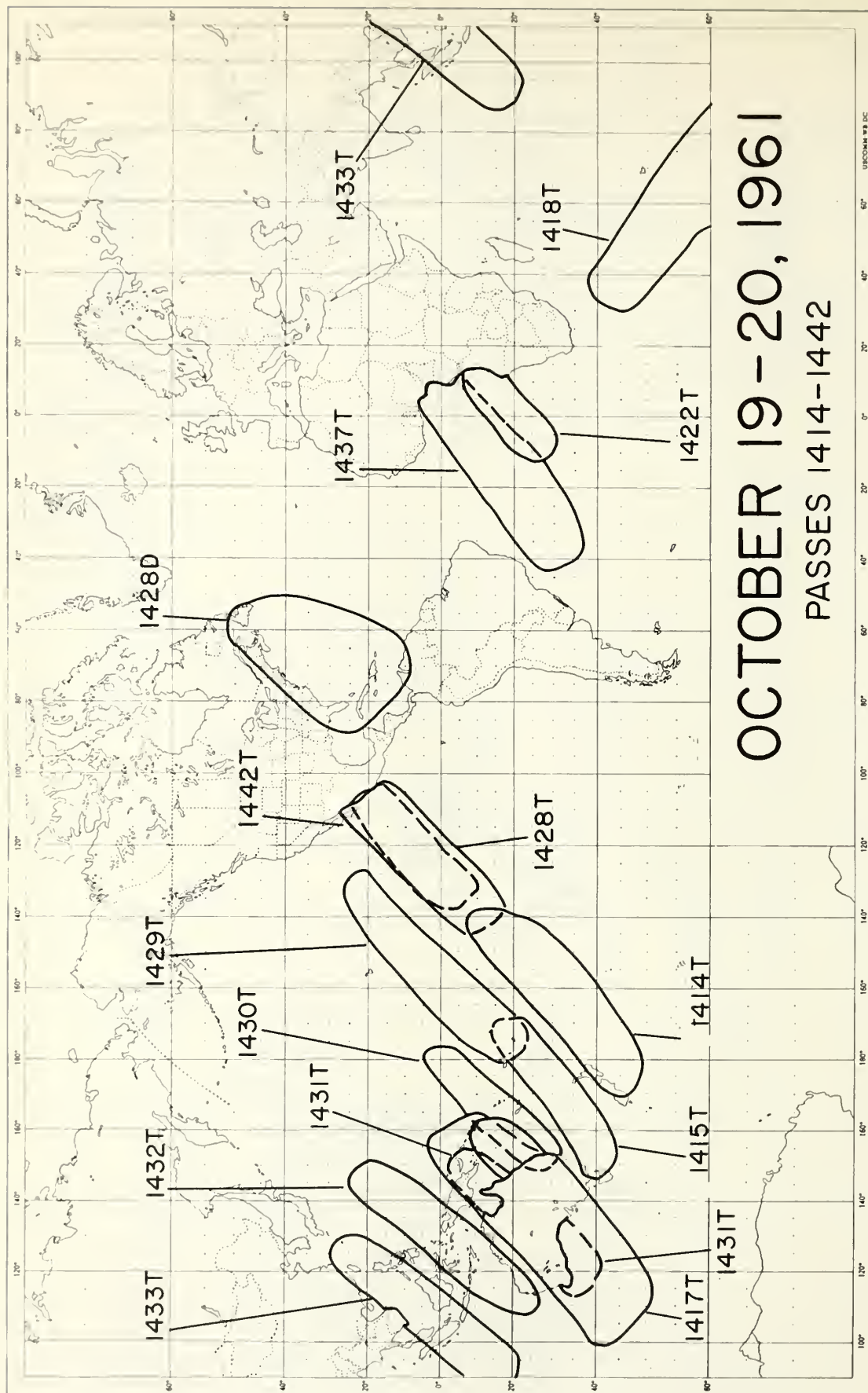




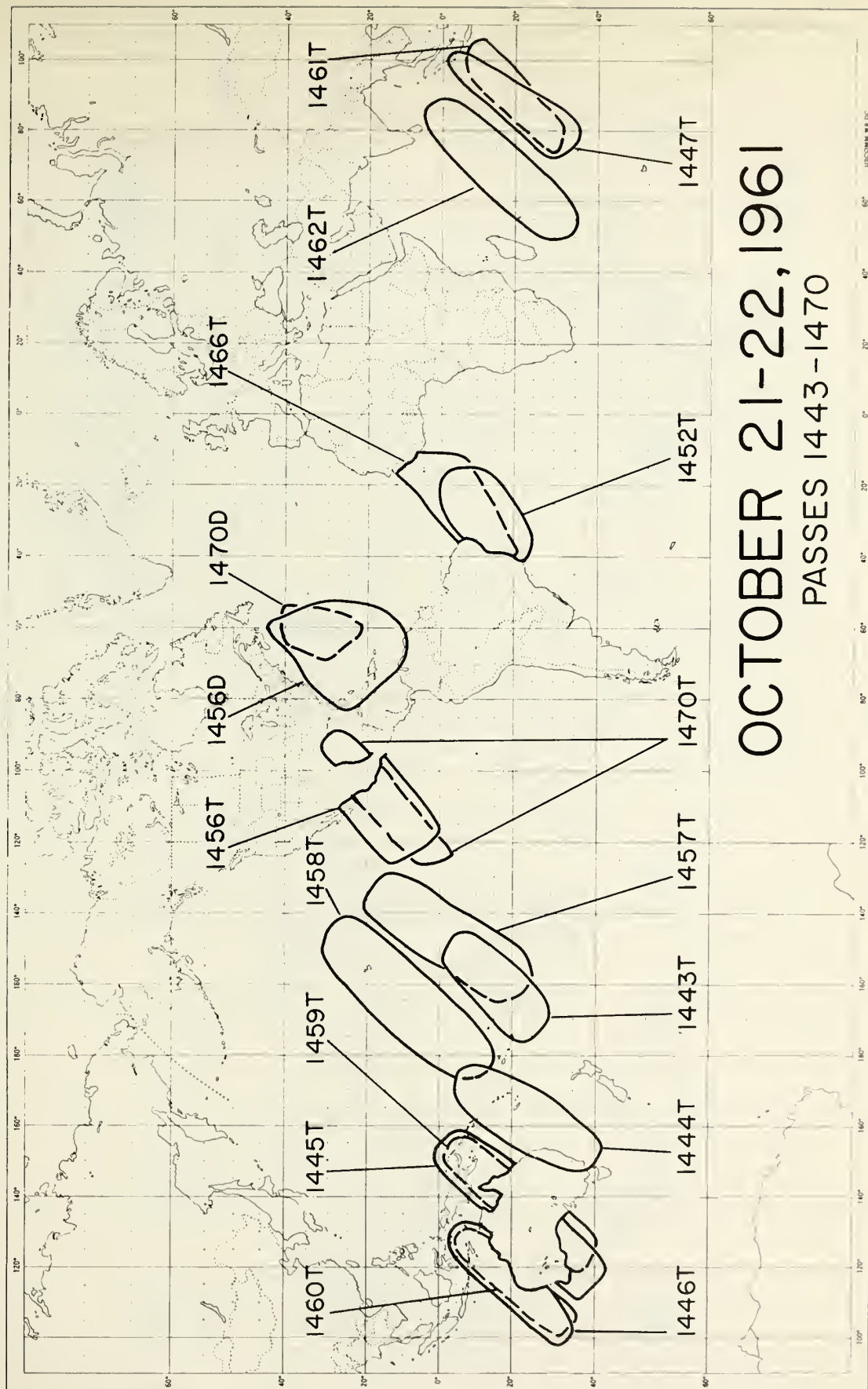






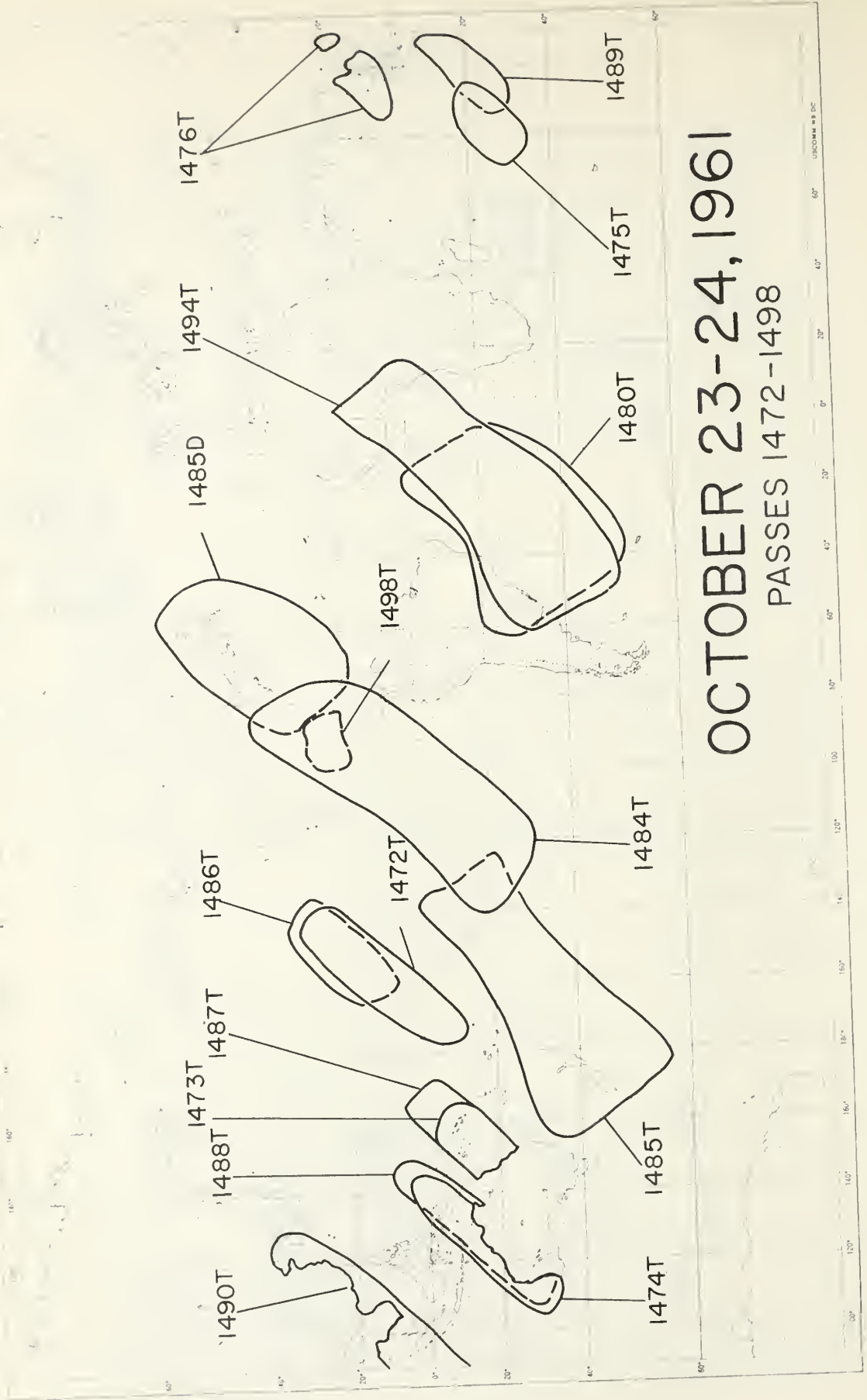


OCTOBER 19-20, 1961  
 PASSES 1414-1442



# OCTOBER 21-22, 1961

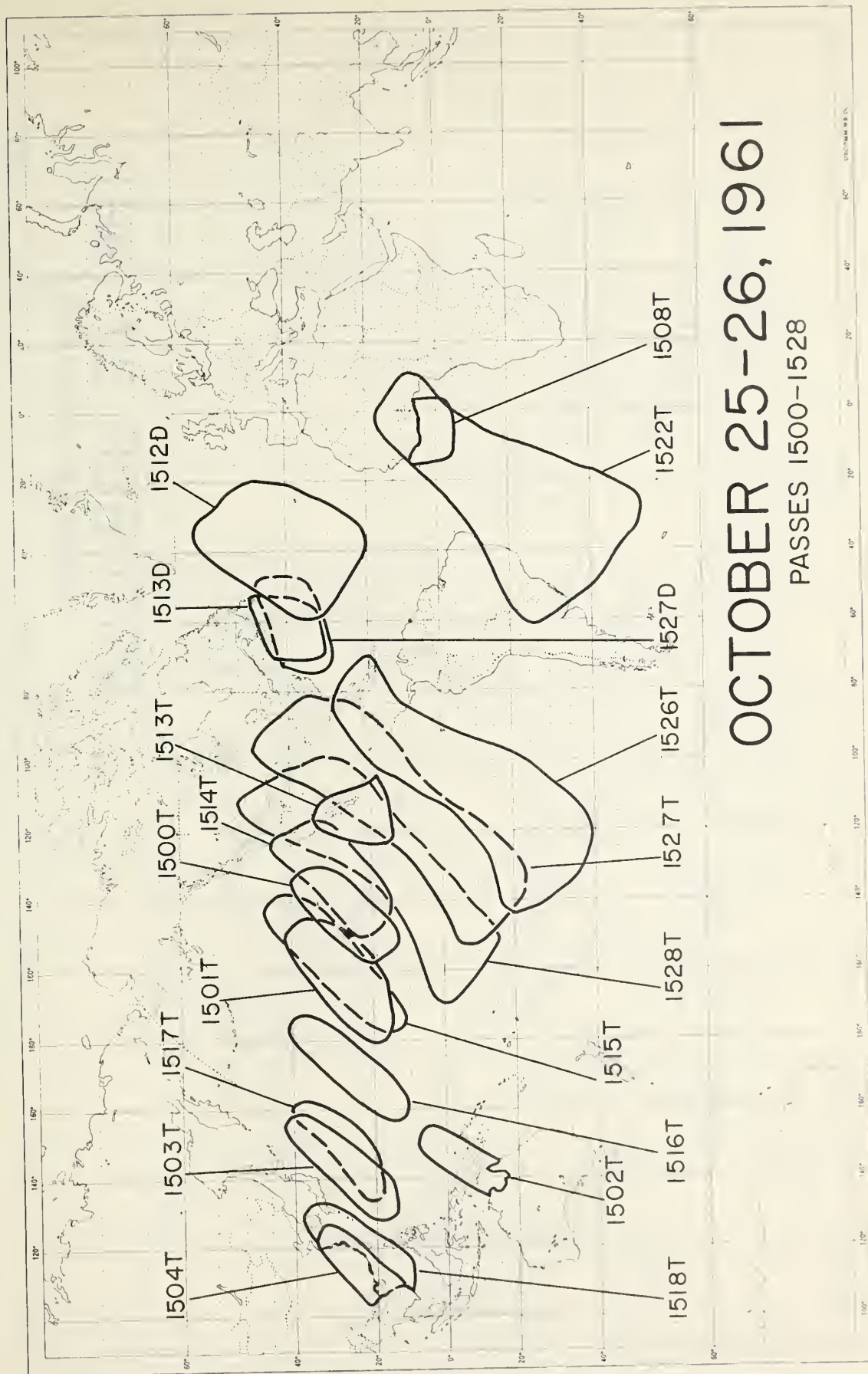
## PASSES 1443-1470



# OCTOBER 23-24, 1961

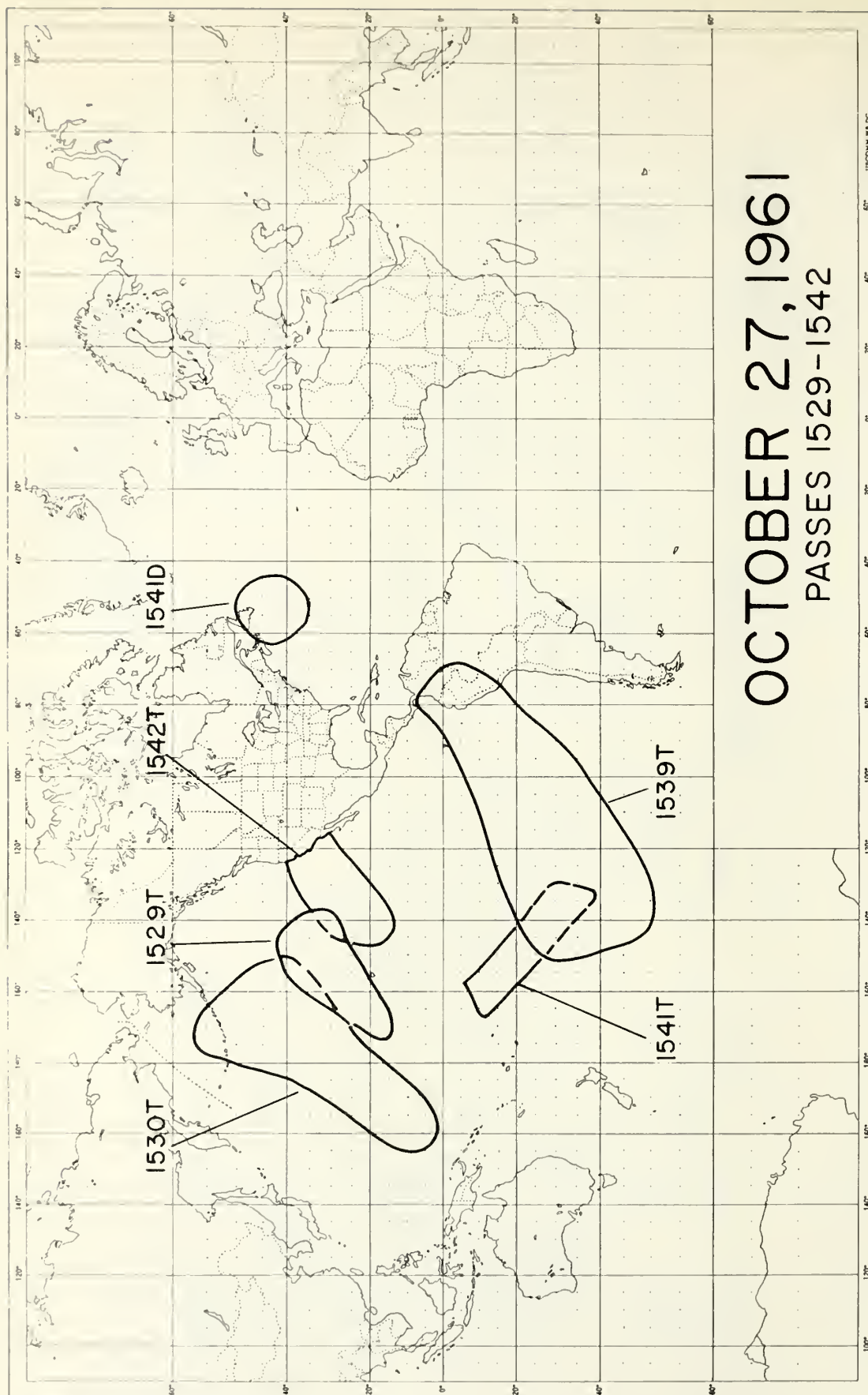
## PASSES 1472-1498



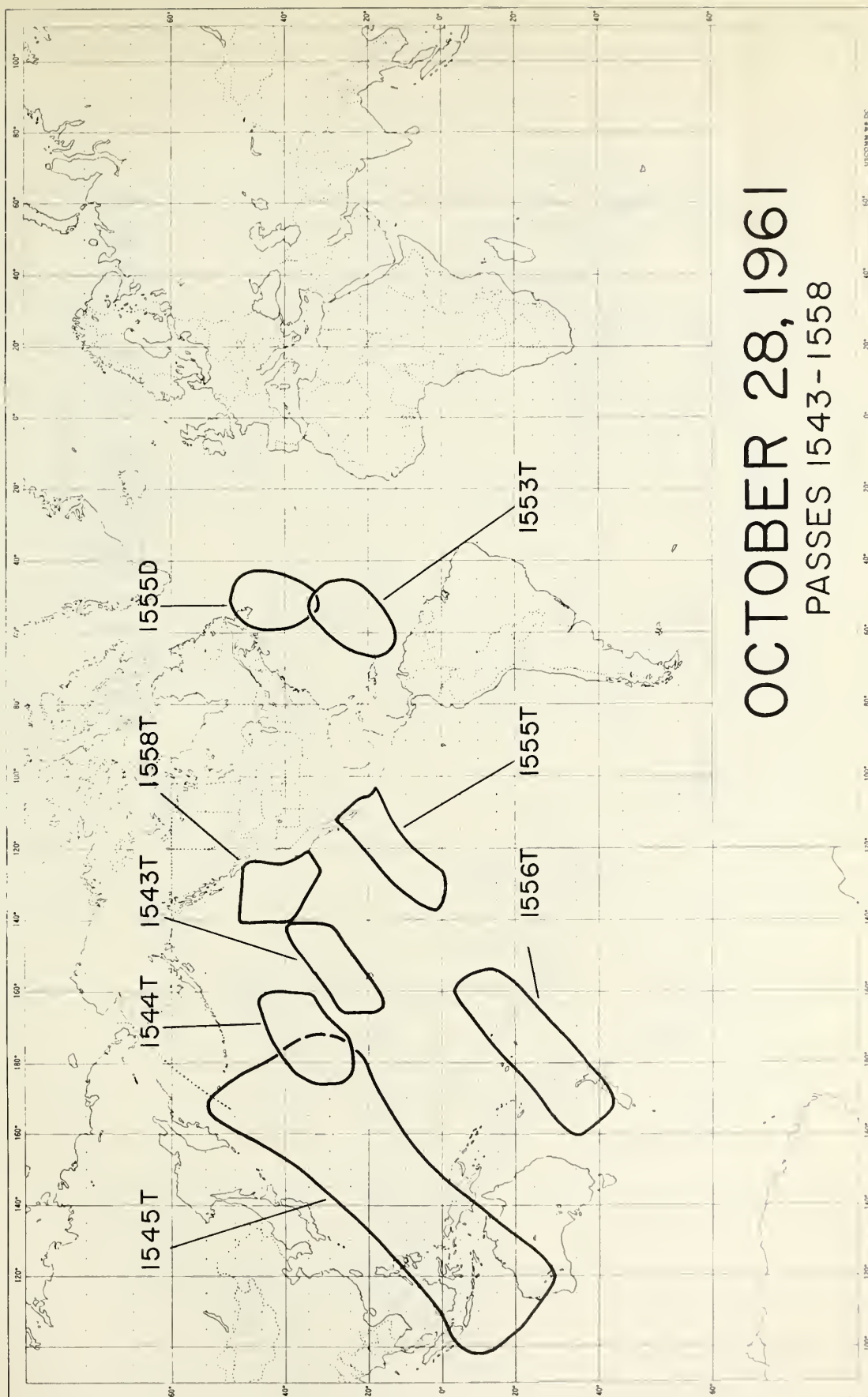


# OCTOBER 25-26, 1961

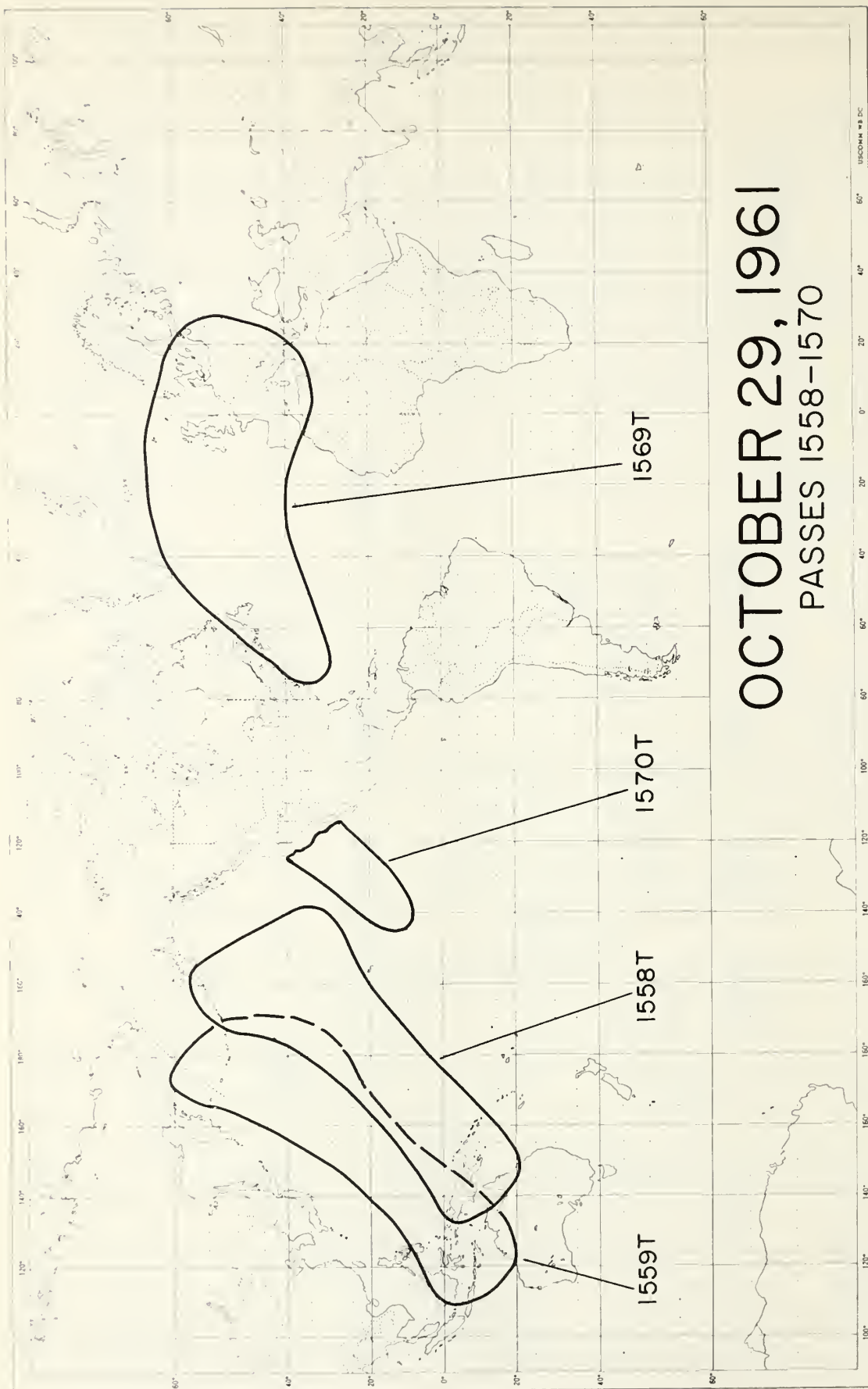
## PASSES 1500-1528

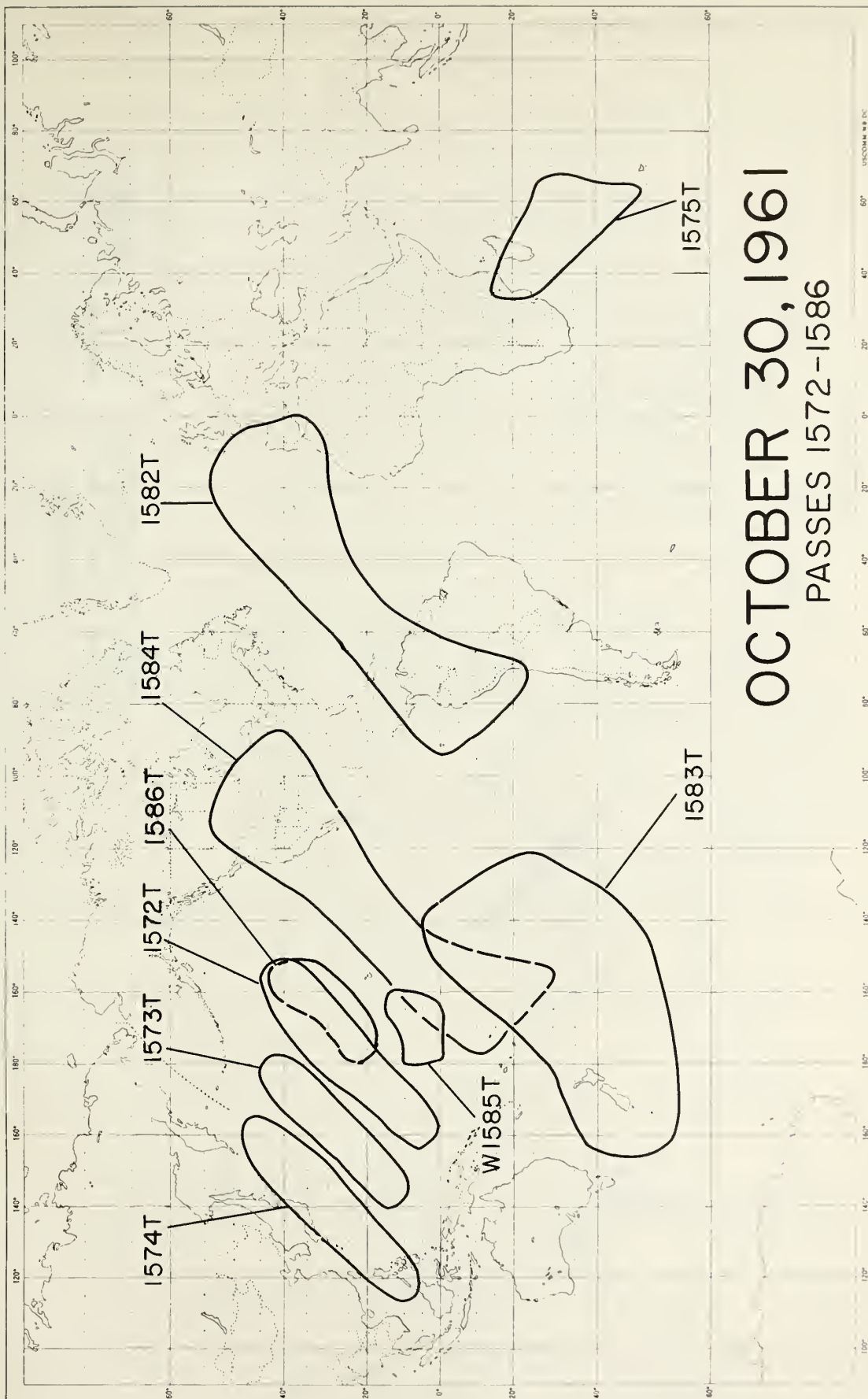


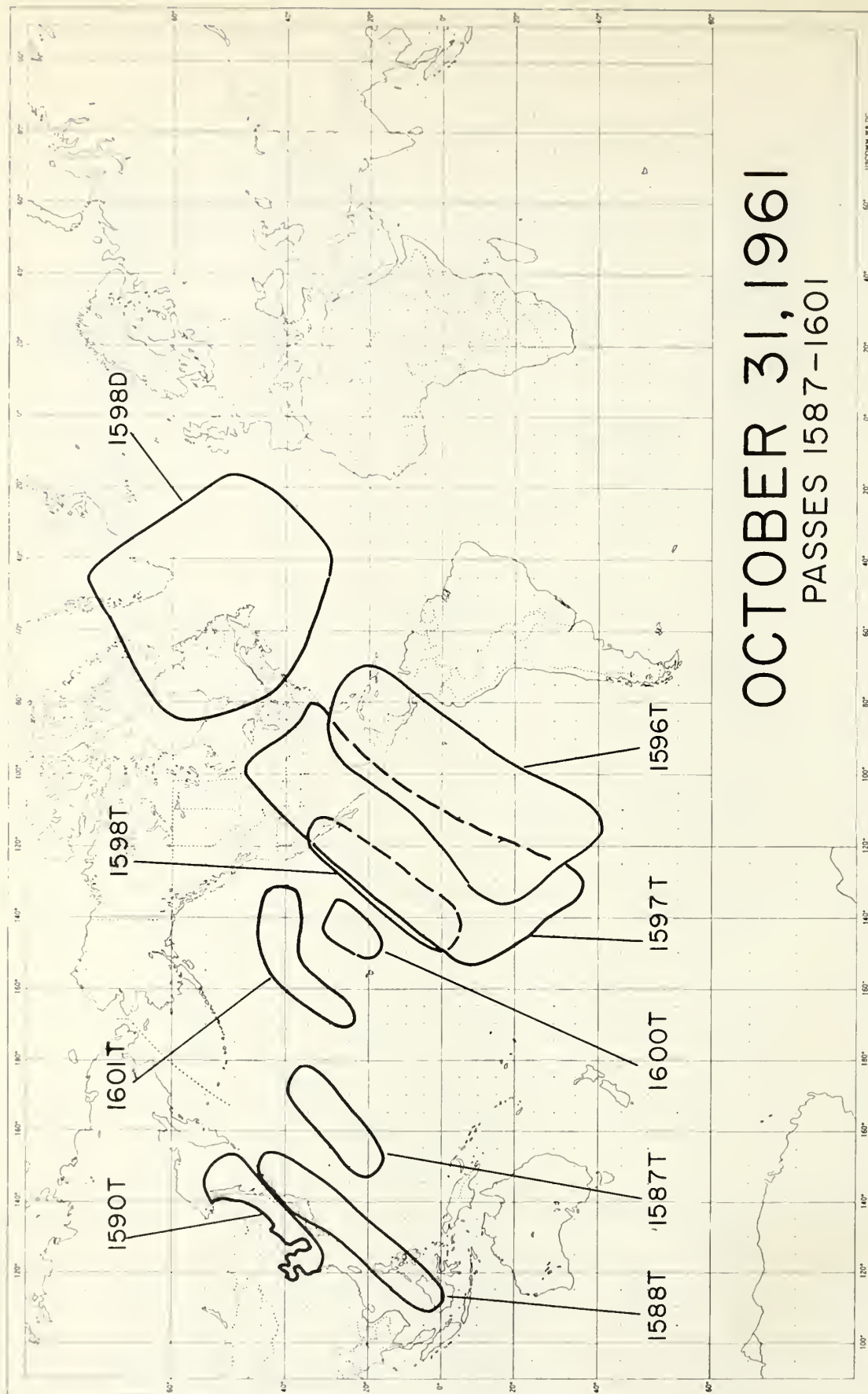
OCTOBER 27, 1961  
PASSES 1529-1542





















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